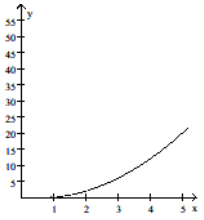
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Match the numerical model to the corresponding model.

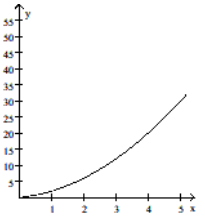
1)

x	0	1	2	3	4	5
y	0	2	10	21	36	55

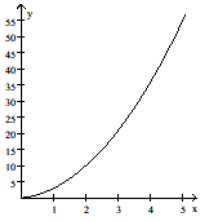
A)



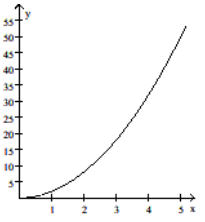
B)



C)



D)



Answer: C

2)

x	1	3	5	7	9	11
y	2	0	6	20	42	72

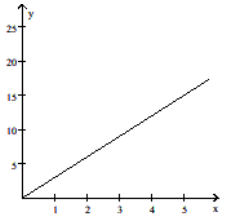
A) $y = (x-2)(x-3)$ B) $y = x^2+5x+6$ C) $y = x^2-5x-6$ D) $y = (x+2)(x+3)$

Answer: A

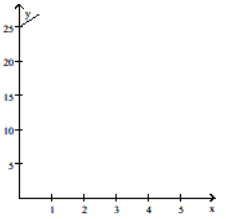
3)

x	0	1	2	3	4	5
y	25	22	19	16	13	10

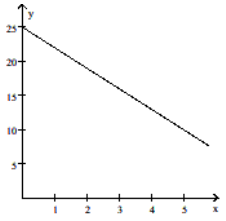
A)



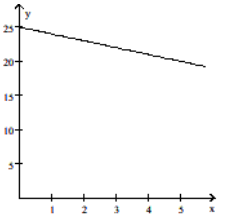
B)



C)



D)



Answer: C

4)

x	2	4	6	8	10	12
y	10	20	30	40	50	60

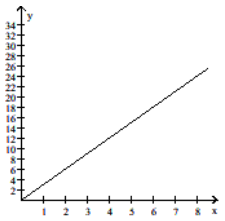
A) $y = \frac{1}{5}x$ B) $y = x + 5$ C) $y = 5x + 1$ D) $y = 5x$

Answer: D

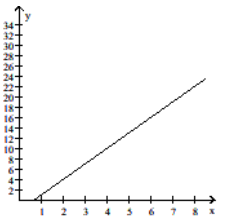
5)

x	3	4	5	6	7	8
y	11	14	17	20	23	26

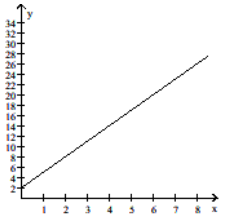
A)



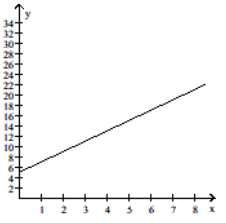
B)



C)



D)



Answer: C

6)

x	0	1	2	3	4	5
y	60	58	52	42	28	10

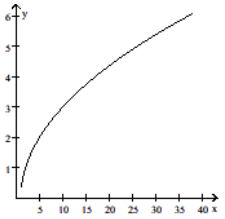
A) $y = 60 - 2x^2$ B) $y = 60 - 2x$ C) $y = x + 60$ D) $y = 60 - x^2$

Answer: A

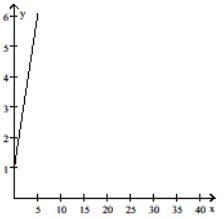
7)

x	0	3	8	15	24	35
y	1	2	3	4	5	6

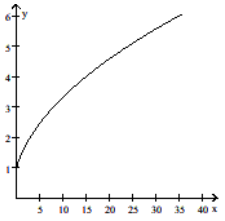
A)



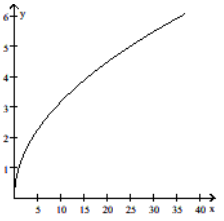
B)



C)



D)



Answer: C

8)

x	3	5	7	9	11	13
y	14	26	38	50	62	74

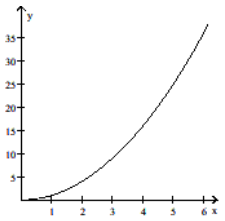
A) y = 7x - 7 B) y = 5x - 1 C) y = 3x+5 D) y = 6x - 4

Answer: D

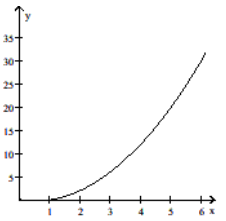
9)

x	1	2	3	4	5	6
y	0	3	8	15	24	35

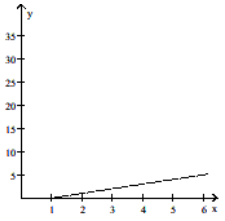
A)



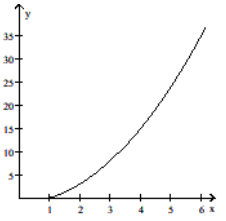
B)



C)



D)



Answer: D

10)

x	2	9	16	23	30	37
y	1	2	3	4	5	6

A) $y = \frac{x + 5}{5}$ B) $y = \frac{x = 7}{5}$ C) $y = \frac{7 - x}{5}$ D) $y = \frac{x + 5}{7}$

Answer: D

Solve the problem.

11) The following data set gives the average home value, in dollars, for a city at 5-year intervals.

Year	1980	1985	1990	1995	2000	2005
Value	105,541	113,591	117,991	130,831	144,541	163,961

Determine where f is increasing or decreasing.

A) f is decreasing for the given x values.
B) f is increasing for the given x-values.
C) f is constant for the given x-values.
D) f is increasing until 1980, then f is decreasing for remainder of x-values.

Answer: B

12) The following data set gives the average home value, in dollars, for a city at 5-year intervals.

Year	1980	1985	1990	1995	2000	2005
Value	104,639	103,834	103,394	102,110	95,739	90,219

Determine where f is increasing or decreasing.

A) f is constant for the given x-values.
B) f is increasing until 1980, then decreasing for remainder of x-values.
C) f is decreasing for the given x-values.
D) f is increasing for the given x-values.

Answer: C

13) The following data set gives the average home value, in dollars, for a city at 5-year intervals.

Year	1980	1985	1990	1995	2000	2005
Value	103,640	113,261	117,903	129,501	144,211	151,001

In which 5-year period did average home value change the most?

A) 2000-2005 B) 1985-1990 C) 1995-2000 D) 1990-1995

Answer: C

14) Some of the results of an analysis, on the makeup of garbage, are given in the following table. The table displays various years which gives the number of pounds per person per day of various types of waste materials.

Waste materials	1980	1990	2000	2008
Glass	0.20	0.34	0.36	0.28
Plastics	0.01	0.08	0.19	0.32
Metals	0.32	0.38	0.35	0.34
Paper	0.91	1.19	1.32	1.60

For glass, calculate the average rate of change between 1990 and 2000. Then interpret what this value means.

A) From 1990 to 2000, the number of pounds of glass per person per day decreased by 0.002 per year.
B) From 1990 to 2000, the number of pounds of glass per person per day increased by 0.002 per year.
C) From 1990 to 2000, the number of pounds of glass per person per day increased by 0.11 per year.
D) From 1990 to 2000, the number of pounds of glass per person per day decreased by 0.11 per year.

Answer: B

15) Some of the results of an analysis, on the makeup of garbage, are given in the following table. The table displays various years which gives the number of pounds per person per day of various types of waste materials.

Waste materials	1980	1990	2000	2008
Glass	0.20	0.34	0.36	0.28
Plastics	0.01	0.08	0.19	0.32
Metals	0.32	0.38	0.35	0.34
Paper	0.91	1.19	1.32	1.60

For glass, calculate the average rate of change between 2000 and 2008. Then interpret what this value means.

A) From 2000 to 2008, the number of pounds of glass per person per day increased by 0.01 per year.
B) From 2000 to 2008, the number of pounds of glass per person per day decreased by 0.01 per year.
C) From 2000 to 2008, the number of pounds of glass per person per day decreased by 0.08 per year.
D) From 2000 to 2008, the number of pounds of glass per person per day increased by 0.008 per year.

Answer: B

16) Some of the results of an analysis, on the makeup of garbage, are given in the following table. The table displays various years which gives the number of pounds per person per day of various types of waste materials.

Waste materials	1980	1990	2000	2008
Glass	0.20	0.34	0.36	0.28
Plastics	0.01	0.08	0.19	0.32
Metals	0.32	0.38	0.35	0.34
Paper	0.91	1.19	1.32	1.60

For paper, calculate the average rates of change between consecutive data points in the table. Interpret the meani your results.

A) The rate of increase slows down during the 1980's, but then increases during the 1990's and 2000-2008.
B) The rate of increase slows down during the 1990's, but then increases during 2000-2008.
C) The rate of increase increases during the 1990's, but then decreases during 2000-2008.
D) The rate of increase stays the same from the 1980's through 2000-2008.

Answer: B

17) Some of the results of an analysis, on the makeup of garbage, are given in the following table. The table displays various years which gives the number of pounds per person per day of various types of waste materials.

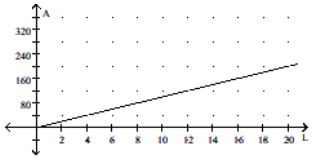
Waste materials	1980	1990	2000	2008
Glass	0.20	0.34	0.36	0.28
Plastics	0.01	0.08	0.19	0.32
Metals	0.32	0.38	0.35	0.34
Paper	0.91	1.19	1.32	1.60

For plastics, calculate the average rates of change between consecutive data points in the table. Interpret the mea your results.

A) The rate of increase decreases from each decade to the next.
B) The rate of increase increases from each decade to the next.
C) The rate of increase decreases during the 1990's, but then increases during 2000-2008.
D) The rate of increase increases during the 1990's, but then decreases during the 2000-2008.

Answer: B

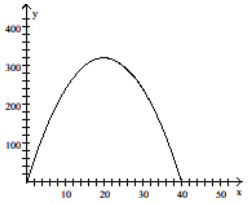
18) The graph shows the relationship between the area A of a rectangle and the length L, if the width is fixed. Find the area if the length is 20 cm.



A) 180 cm^2 B) 170 cm^2 C) 220 cm^2 D) 200 cm^2

Answer: D

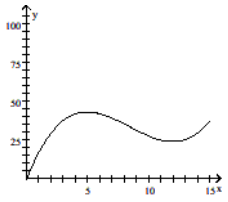
19) A rock is thrown vertically upward from the surface of the moon at a velocity of 32 m/sec. The graph shows the height y of the rock, in meters, after x seconds. Estimate and interpret the turning point (the point at which the graph reaches its maximum value).



A) The turning point is at approximately (40, 320). This is the point at which the rock reaches its maximum height and starts to fall back towards the surface of the moon.
B) The turning point is at approximately (20, 320). This is the point at which the rock reaches its maximum height and starts to fall back towards the surface of the moon.
C) The turning point is at approximately (40, 0). This is the point at which the rock reaches the surface of the moon again.
D) The turning point is at approximately (20, 320). This is the point at which the rock reaches its maximum velocity and starts to slow down.

Answer: B

20) The graph depicts a person's speed y, in miles per hour, during a 15-minute period of driving.
The graph has two turning points.The first turning point is the point at which the graph stops rising and starts to
The second turning point is the point at which the graph stops falling and starts to rise again.
Estimate and interpret the turning points.



A) The first turning point is at approximately (5, 43). This is where the person's distance from the starting point stops increasing and starts to decrease. The second turning point is at approximately (12, 24). This is where the person's distance from the starting point stops decreasing and starts to increase again.
B) The first turning point is at approximately (4, 43). This is where the person's distance from the starting point stops increasing and starts to decrease. The second turning point is at approximately (11, 24). This is where the person's distance from the starting point stops decreasing and starts to increase again.
C) The first turning point is at approximately (5, 43). This is where the person's speed first stops increasing and starts to decrease. The second turning point is at approximately (12, 24). This is where the person's speed stops decreasing and starts to increase again.
D) The first turning point is at approximately (6, 43). This is where the person's speed first stops increasing and starts to decrease. The second turning point is at approximately (13, 24). This is where the person's speed stops decreasing and starts to increase again.

Answer: C

21) The following information pertains to a bakery which makes donuts.

# of cases of donuts	10	20	30	40	50	60	70	80	90
Profit (in dollars)	868	1790	1990	2450	2480	2390	2220	1320	1000

Make a scatterplot of the data. Based upon the scatterplot, what type of function would best model the data?

A) Constant function B) Quadratic function C) Linear function D) All of the above

Answer: B

22) The following information pertains to a bakery which makes donuts.

# of cases of donuts made	10	20	30	40	50	60	70	80	90
Profit (in dollars)	868	1790	1990	2450	2490	2390	2220	1320	1000

Make a scatterplot of the data. Then graph the following four functions on the same coordinate system: $f_1(x) = 2$ $f_2(x) = 40x + 1000$; $f_3(x) = -x^2 + 100x$; $f_4(x) = -x^2 + 80x + 200$. Which function best models the profit for x cases of donuts?

A) f_4 B) f_1 C) f_3 D) f_2

Answer: C

23) The following information pertains to a bakery which makes donuts.

# of cases of donuts made	10	20	30	40	50	60	70	80	90
Profit (in dollars)	868	1790	1990	2450	2480	2390	2220	1320	1000

Make a scatterplot of the data. Then graph the following two functions on the same coordinate system: $f_1(x) = -x^2 + 100x$; $f_2(x) = -x^2 + 80x + 200$. Decide which function best models the data, and then use that function to estimate the maximum possible profit.

A) f_1 ; maximum profit is $2500. B) f_2 ; maximum profit is $1800.

C) f_1 ; maximum profit is $2900. D) f_2 ; maximum profit is $2670.

Answer: A

24) The following information pertains to a bakery which makes donuts.

# of cases of donuts	10	20	30	40	50	60	70	80	90
Profit (in dollars)	868	1790	1990	3950	3500	5590	5220	6320	8100

Make a scatterplot of the data. Based upon the scatterplot, what type of function would best model the data?

A) Constant function B) Quadratic function C) Linear function D) All of the above

Answer: C

25) The following information pertains to a bakery which makes donuts.

# of cases of donuts	10	20	30	40	50	60	70	80	90
Profit (in dollars)	868	1790	1990	3950	3500	5590	5220	6320	8100

Make a scatterplot of the data. Then graph the following four functions on the same coordinate system: $f_1(x) = 2$ $f_2(x) = 85x$; $f_3(x) = -x^2 + 100x$; $f_4(x) = 40x + 1000$. Which function best models the profit for x cases of donuts?

A) f_4 B) f_1 C) f_2 D) f_3

Answer: C

26) The following information pertains to a bakery which makes donuts.

# of cases of donuts	10	20	30	40	50	60	70	80	90
Profit (in dollars)	868	1790	1990	3950	3500	5590	5220	6320	8100

Make a scatterplot of the data. Then graph the following two functions on the same coordinate system: $f_1(x) = -x^2 + 100x$; $f_2(x) = 85x$. Decide which function best models the data, and then use that function to estimate the profit associated with making 45 cases of donuts.

A) f_2 ; profit for 45 cases is $4500. B) f_2 ; profit for 45 cases is $3825.

C) f_1 ; profit for 45 cases is $3675. D) f_1 ; profit for 45 cases is $2475.

Answer: B

27) The following information pertains to a bakery which makes donuts.

# of cases of donuts	10	20	30	40	50	60	70	80	90
Profit (in dollars)	868	1790	1990	3950	3500	5590	5220	6320	8100

Make a scatterplot of the data. Then graph the following two functions on the same coordinate system: $f_1(x) = -x^2 + 100x$; $f_2(x) = 85x$. Decide which function best models the data, and then use that function to estimate the profit associated with making 35 cases of donuts.

A) f_2 ; Profit for 35 cases is $2975. B) f_1 ; Profit for 35 cases is $2275.

C) f_1 ; Profit for 35 cases is $2625. D) f_2 ; Profit for 35 cases is $3525.

Answer: A

28) A ball is shot up in the air and its height, h, above the ground in feet is given by the function $h(x) = -16x^2 + 45x$, where x is the number of seconds the ball has been in flight. Graph this function and find the x-value for which the maximum height of the ball is attained. Round your answer to the hundredths place.

A) 1.41 B) 1.30 C) 1.68 D) 1.53

Answer: A

29) A ball is shot up in the air and its height, h, above the ground in feet is given by the function $h(x) = -16x^2 + 46x$, where x is the number of seconds the ball has been in flight. Graph this function and find the maximum height that the ball attains. Round your answer to the hundredths place.

A) 30.49 B) 33.06 C) 34.00 D) 34.40

Answer: B

Solve the equation algebraically.

30) $v^2 + 2 = 8 - 4v^2$

A) $\pm\sqrt{\frac{6}{5}}$ B) $\pm\sqrt{\frac{1}{4}}$ C) $\pm\sqrt{\frac{1}{2}}$ D) $\pm\sqrt{\frac{5}{6}}$

Answer: A

31) $(x - 12)^2 = 4$

A) 10; -14 B) 8; 8 C) -14; -14 D) 10; 14

Answer: D

32) $x^2 - 7x - \frac{1}{7} = 0$

A) $7 \pm \sqrt{\frac{347}{7}}$ B) $\frac{7}{2} \pm \frac{1}{2}\sqrt{\frac{339}{7}}$ C) $\frac{7}{2} \pm \frac{1}{2}\sqrt{\frac{347}{7}}$ D) $-\frac{7}{2} \pm \frac{1}{2}\sqrt{\frac{347}{7}}$

Answer: C

33) $x(x - 5) = 14$

A) -2; 7 B) 0; 5 C) 2; -7 D) 5, -14

Answer: A

34) $x(2x + 3) = -1$

A) 1; 1 B) -1.5, 1 C) -1; -0.5 D) 0; -1.5

Answer: C

35) $x - \sqrt{10x - 25} = 0$

A) - 25 ; 1 B) 25 ; -1 C) - 5 D) 5

Answer: D

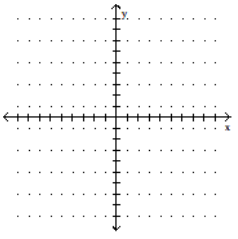
36) $6\sqrt{x} + x = 3$

A) $21 - 12\sqrt{3}$ B) $221 \pm 212\sqrt{3}$ C) $21 \pm 12\sqrt{3}$ D) $-21 \pm 12\sqrt{3}$

Answer: A

Solve the equation graphically by converting it to an equivalent equation with 0 on the right-hand side and then finding the x-intercepts.

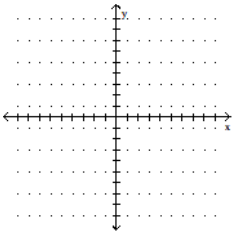
37) $7x - 6 = \sqrt{x + 9}$



A) -9 B) 0.4 C) -1.3 D) 1.3

Answer: D

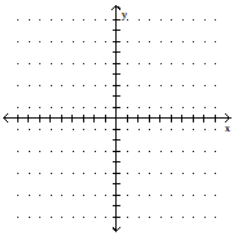
38) $|5x - 9| = 3 - |x - 2|$



A) 1.3, 2.3 B) -8 C) 2.3 D) 1.3

Answer: A

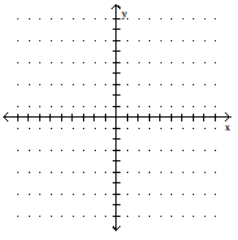
39) $4x - 20 = x^3 - 9$



A) 2.8 B) -29 C) -2.8, -29 D) -2.8

Answer: D

40) $5x^2 = |x|$



A) $0, -\frac{\sqrt{5}}{5}, \frac{\sqrt{5}}{5}$ B) $0, -\frac{1}{5}, \frac{1}{5}$ C) 0 D) $-\frac{1}{5}, \frac{1}{5}$

Answer: B

Determine whether the formula determines y as a function of x.

41) $y = 5x - 9$

A) No B) Yes

Answer: B

42) $y = -x$

A) Yes B) No

Answer: A

43) $y = x^2 - 6$

A) No B) Yes

Answer: B

44) $y = -7x^2 - 3x - 7$

A) No B) Yes

Answer: B

45) $y = 15$

A) Yes B) No

Answer: A

46) $x = y^2 - 9$

A) Yes B) No

Answer: B

47) $y^2 = (x - 6)(x + 1)$

A) No B) Yes

Answer: A

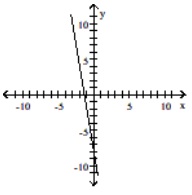
48) $y = \sqrt[5]{x}$

A) No B) Yes

Answer: B

Determine whether the graph is the graph of a function.

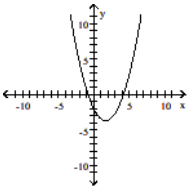
49)



A) Yes B) No

Answer: A

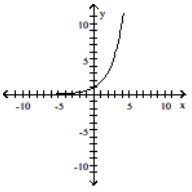
50)



A) No B) Yes

Answer: B

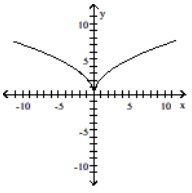
51)



A) Yes B) No

Answer: A

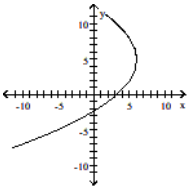
52)



A) No B) Yes

Answer: B

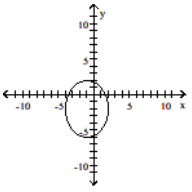
53)



A) Yes B) No

Answer: B

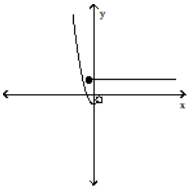
54)



A) Yes B) No

Answer: B

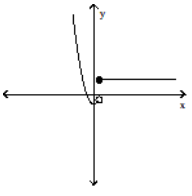
55)



A) Yes B) No

Answer: B

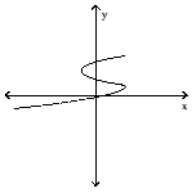
56)



A) Yes B) No

Answer: A

57)



A) Yes B) No

Answer: B

Find the domain of the given function.

58) $f(x) = \sqrt{2 - x}$

A) All real numbers B) $(-\infty,2) \cup (2,\infty)$ C) $(\sqrt{2},\infty)$ D) $(-\infty, 2]$

Answer: D

59) $f(x) = \dfrac{x}{x - 6}$

A) $(-\infty,-6) \cup (-6,\infty)$ B) All real numbers C) $(-\infty,6) \cup (6,\infty)$ D) $(0,\infty)$

Answer: C

60) $f(x) = \dfrac{(x + 6)(x - 6)}{x^2 + 36}$

A) $(36,\infty)$ B) $(-\infty,-36) \cup (-36,36) \cup (36,\infty)$

C) $(-\infty,6) \cup (-6,6) \cup (6,\infty)$ D) All real numbers

Answer: D

61) $f(x) = \dfrac{\sqrt{x + 2}}{(x + 4)(x - 3)}$

A) $(0,\infty)$ B) $(-\infty, -4) \cup (-4 -2) \cup (-2, 3) \cup (3, \infty)$

C) All real numbers D) $[-2, 3) \cup (3, \infty)$

Answer: D

62) $f(x) = -3$

A) $[-3, 3]$ B) All real numbers C) $(-\infty,-3) \cup (-3,\infty)$ D) $[0,\infty)$

Answer: B

63) $f(x) = \dfrac{5}{x^2}$

A) $(-\infty,3] \cup [3,\infty)$ B) $(-\infty,0) \cup (0,\infty)$ C) All real numbers D) $[0,\infty)$

Answer: B

64) $f(x) = \sqrt{x^2 + 46}$

A) $(-\infty, \infty)$ B) $(-\infty, 46) \cup (46, \infty)$ C) $(6.78232998, \infty)$ D) $[6.78232998, \infty)$

Answer: A

65) $f(x) = \sqrt{x^4 - 81x^2}$

A) $(-\infty, -9] \cup [9, \infty)$ B) $(-\infty, -9] \cup [0] \cup [9, \infty)$

C) $(-\infty, \infty)$ D) $(-\infty, -9) \cup (9, \infty)$

Answer: B

66) $f(x) = \dfrac{x}{x^2 + 3x}$

A) $(-\infty, 0) \cup (0, 3) \cup (3, \infty)$ B) $(-\infty, -3) \cup (-3, \infty)$

C) $(-\infty, -3) \cup (-3, 0) \cup (0, \infty)$ D) $(-\infty, 0) \cup (0, \infty)$

Answer: C

67) $f(x) = \dfrac{\sqrt{9 - x^2}}{x - 1}$

A) $(-\infty, -3) \cup (3, \infty)$ B) $[-3, 1) \cup (1, 3]$ C) $[-9, 1) \cup (1, 9]$ D) $[-3, 3]$

Answer: B

Find the range of the function.

68) $f(x) = (x - 2)^2 + 2$

A) $(-\infty, 2)$ B) $(-\infty, \infty)$ C) $[0, \infty)$ D) $[2, \infty)$

Answer: D

69) $f(x) = x^2 + 1$

A) $[1, \infty)$ B) $(-1, \infty)$ C) $(-\infty, 1]$ D) $(-\infty, \infty)$

Answer: A

70) $f(x) = (x + 3)^2 + 7$

A) $(7, \infty)$ B) $(-7, \infty)$ C) $[7, \infty)$ D) $(-\infty, \infty)$

Answer: C

71) $f(x) = 7x - 5$

A) $(-5, \infty)$ B) $[0, \infty)$ C) $(-\infty, \infty)$ D) $[-5, \infty)$

Answer: C

72) $y = 4x^8$

A) $[4, \infty)$ B) (∞, ∞) C) $[-4, \infty)$ D) $[0, \infty)$

Answer: D

73) $f(x) = \sqrt{4 + x}$

A) $[-4, \infty)$ B) $(-\infty, \infty)$ C) $[0, \infty)$ D) $(0, \infty)$

Answer: C

74) $f(x) = \dfrac{16}{15 - x}$

A) $(-\infty, 15) \cup (15, \infty)$ B) $(-\infty, 0) \cup (0, \infty)$ C) $(-\infty, \infty)$ D) $(0, \infty)$

Answer: B

75) $f(x) = 7 - x^2$

A) $[-\sqrt{7}, \sqrt{7}\,]$ B) $[7, \infty)$ C) $(-\infty, \infty)$ D) $(-\infty, 7]$

Answer: D

76) $f(x) = 3 + \sqrt{8 - x}$

A) $[8, \infty)$ B) $[3, \infty)$ C) $(-\infty, 3]$ D) $(-\infty, \infty)$

Answer: B

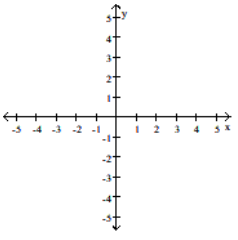
77) $f(x) = \dfrac{5}{5 - x^2}$

A) $(-\infty, 0) \cup (0, \infty)$ B) $(-\infty, \infty)$ C) $(-\infty, 0) \cup [1, \infty)$ D) $(-\infty, 0) \cup [5, \infty)$

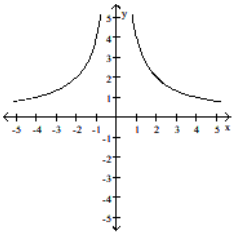
Answer: C

Graph the function and determine if it has a point of discontinuity at x = 0. If there is a discontinuity, tell whether it is removable or non-removable.

78) $f(x) = \dfrac{4}{x}$

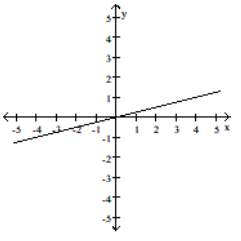


A)



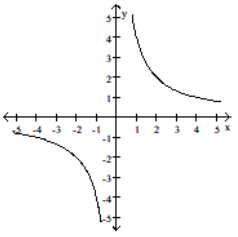
Yes; removable

B)

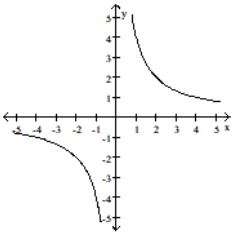


No

C)



D)

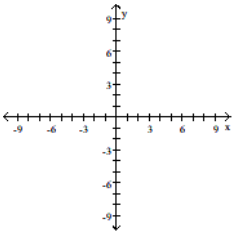


No

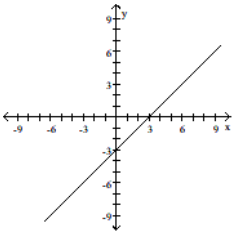
Yes; non-removable

Answer: D

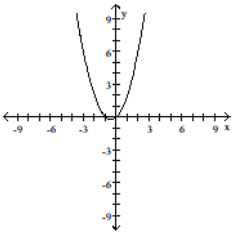
79) $g(x) = \frac{x^2 - 3x}{x}$



A)



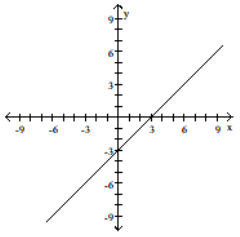
B)



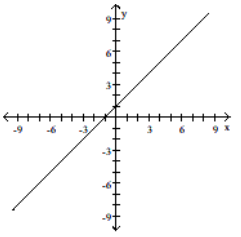
No

No

C)



D)

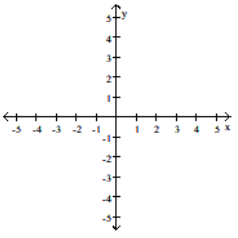


Yes; removable

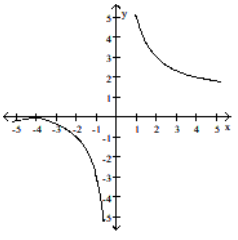
No

Answer: C

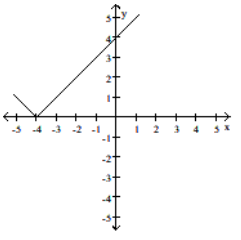
80) $f(x) = \frac{|x + 4|}{x}$



A)



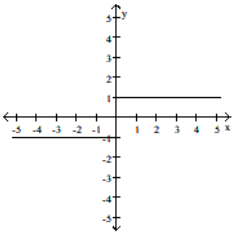
B)



No

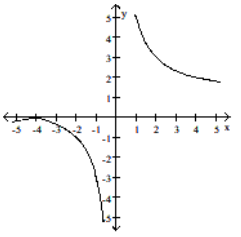
No

C)



Yes; removable

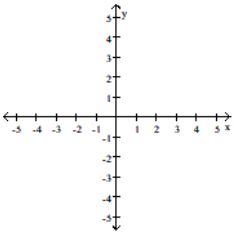
D)



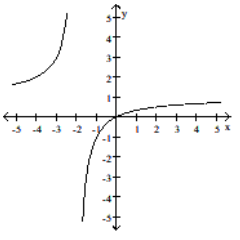
Yes; non-removable

Answer: D

81) $h(x) = \frac{x}{x - 2}$

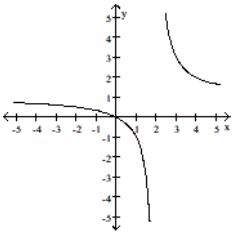


A)



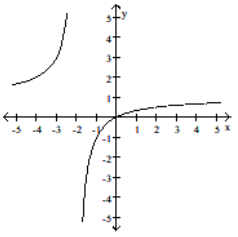
Yes; non-removable

B)



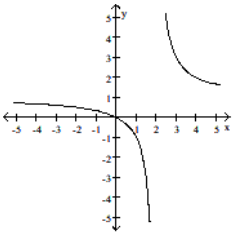
Yes; non-removable

C)



No

D)

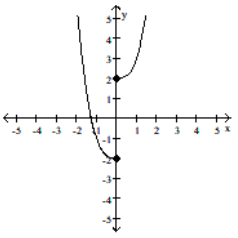


No

Answer: D

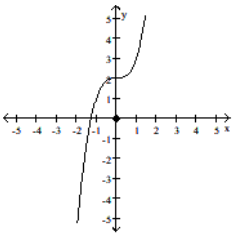
82) $f(x) = \dfrac{x^4 + 2x}{x}$

A)



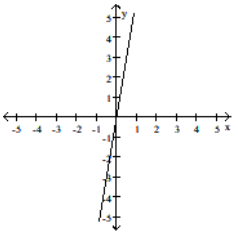
Yes; non-removable

B)



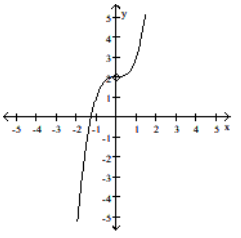
No

C)



No

D)

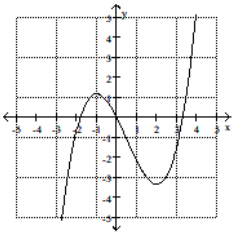


Yes; removable

Answer: D

Solve the problem.

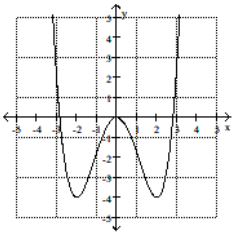
83) Use the graph of f to estimate the local maximum and local minimum.



A) No local maximum; no local minimum
B) Local maximum: -1; local minimum: 2
C) Local maximum: ∞; local minimum: -∞
D) Local maximum: approx. 1.17; local minimum: approx. -3.33

Answer: D

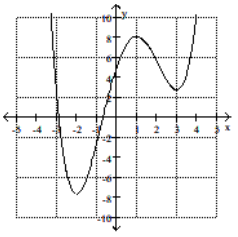
84) Use the graph of f to estimate the local maximum and local minimum.



A) Local maximum: 0; local minimum: -4
B) No local maximum; local minimum: -4
C) Local maximum: ∞; local minima: -2 and 2
D) Local maximum: 0; local minima: -2 and 2

Answer: A

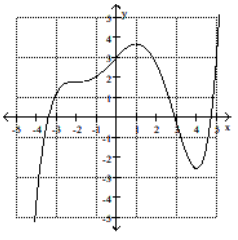
85) Use the graph of f to estimate the local maximum and local minimum.



A) Local maximum: approx. 8.08; local minima: approx. -7.67 and 2.75
B) Local maximum: 1; local minima: -2 and 3
C) No local maximum; local minimum: approx. -7.67
D) Local maximum: ∞; local minima: -2 and 3

Answer: A

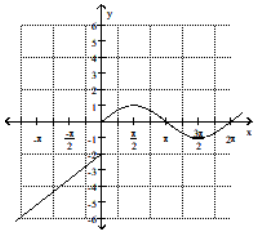
86) Use the graph of f to estimate the local maximum and local minimum.



A) Local maximum: ∞; local minimum: -∞
B) No local maximum; no local minimum
C) Local maximum: approx. 3.66; local minimum: approx. -2.55
D) Local maximum: 1; local minimum: 4

Answer: C

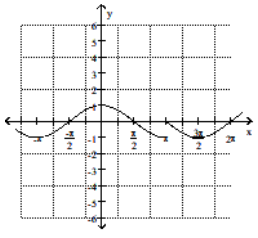
87) Use the graph of f to estimate the local maximum and local minimum.



A) Local maximum: 0 and 1; local minimum: 0 and -1
B) Local maximum: 1; local minimum: -1
C) Local maximum: 1; local minimum: 0 and -1
D) Local maximum: 0 and 1; local minimum: -1

Answer: B

88) Use the graph of f to estimate the local maximum and local minimum.

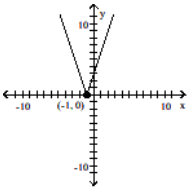


A) Local maximum: 1; local minimum: -1
B) Local maximum: 1; local minimum: approx. 0 and -1
C) Local maximum: 0 and approx 1; local minimum: -1
D) Local maximum: 0; local minimum: -1

Answer: A

Determine the intervals on which the function is increasing, decreasing, and constant.

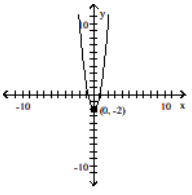
89)



A) Increasing on (1, ∞); Decreasing on (- ∞, 1)
B) Increasing on (- ∞, 1); Decreasing on (1, ∞)
C) Increasing on (- ∞, -1); Decreasing on (-1, ∞)
D) Increasing on (-1, ∞); Decreasing on (- ∞, -1)

Answer: D

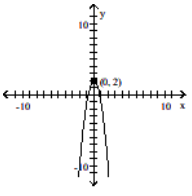
90)



A) Increasing on (- ∞, 0); Decreasing on (- ∞, 0)
B) Increasing on (0, ∞); Decreasing on (- ∞, 0)
C) Increasing on (- ∞, 0); Decreasing on (0, ∞)
D) Increasing on (∞, 0); Decreasing on (0, - ∞)

Answer: B

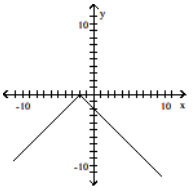
91)



A) Increasing on (- ∞, 0); Decreasing on (0, ∞)
B) Increasing on (0, ∞); Decreasing on (- ∞, 0)
C) Increasing on (∞, 0); Decreasing on (0, - ∞)
D) Increasing on (- ∞, 0); Decreasing on (- ∞, 0)

Answer: A

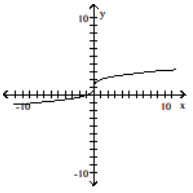
92)



A) Increasing on $(-\infty, -2)$; Decreasing on $(-\infty, -2)$
B) Increasing on $(-\infty, -2)$; Decreasing on $(-2, \infty)$
C) Increasing on $(-2, \infty)$; Decreasing on $(-\infty, -2)$
D) Increasing on $(-2, \infty)$; Decreasing on (-2∞)

Answer: B

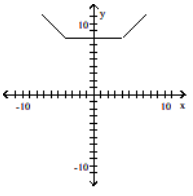
93)



A) Increasing on $(0, \infty)$; Decreasing on $(-\infty, 0)$
B) Increasing on $(-\infty, \infty)$
C) Decreasing on $(-\infty, \infty)$
D) Increasing on $(-\infty, 0)$; Decreasing on $(0, \infty)$

Answer: B

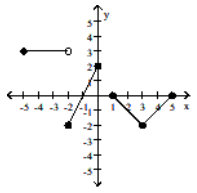
94)



A) Increasing on $(4, \infty)$; Decreasing on $(-\infty, -4)$; Constant on $(-4, 4)$
B) Increasing on $(4, \infty)$; Decreasing on $(-4, \infty)$; Constant on $(-4, 4)$
C) Increasing on $(-\infty, 4)$; Decreasing on $(-\infty, -4)$; Constant on $(4, \infty)$
D) Increasing on $(-\infty, 4)$; Decreasing on $(-4, \infty)$; Constant on $(4, \infty)$

Answer: A

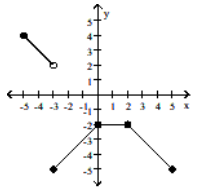
95)



A) Increasing on (-1, 0) and (3, 5); Decreasing on (0, 3); Constant on (-5, -3)
B) Increasing on (-2, 0) and (3, 5); Decreasing on (1, 3); Constant on (-5, -2)
C) Increasing on (-2, 0) and (3, 4); Decreasing on (-5, -2) and (1, 3)
D) Increasing on (1, 3); Decreasing on (-2, 0) and (3, 5); Constant on (2, 5)

Answer: B

96)



A) Increasing on (-3, 0); Decreasing on (-5, -3) and (2, 5); Constant on (0, 2)
B) Increasing on (-3, -1); Decreasing on (-5, -2) and (2, 4); Constant on (-1, 2)
C) Increasing on (-5, -3) and (2, 5); Decreasing on (-3, 0); Constant on (0, 2)
D) Increasing on (-3, 1); Decreasing on (-5, -3) and (0, 5); Constant on (1, 2)

Answer: A

Identify intervals on which the function is increasing, decreasing, or constant.

97) $f(x) = |x - 7| - 3$

A) Increasing: $(-7, \infty)$; decreasing: $(-\infty, -7)$
B) Increasing: $(-3, \infty)$; decreasing: $(-\infty, -3)$
C) Increasing: $(7, \infty)$; decreasing: $(-\infty, 7)$
D) increasing: $(-\infty, 7)$; decreasing: $(7, \infty)$

Answer: C

98) $h(x) = |x + 4| + |x - 8| - 9$

A) Increasing: $(4, \infty)$; decreasing: $(-\infty, 8)$; constant: (4, 8)
B) Increasing: $(8, \infty)$; decreasing: $(-\infty, -4)$; constant: (-4, 8)
C) Increasing: $(9, \infty)$; decreasing: $(-\infty, 4)$; constant: (4, 9)
D) Increasing: $(-\infty, -4)$; decreasing: $(8, \infty)$; constant: (-4, 8)

Answer: B

99) $f(x) = 0.5(x + 4)^2 - 7$

A) Increasing: $(-\infty, -0.5)$; decreasing: $(0.5, \infty)$; constant: $(-0.5, 0.5)$
B) Increasing: $(4, \infty)$; decreasing: $(-\infty, -4)$; constant: $(-4, 4)$
C) Increasing: $(-4, \infty)$; decreasing: $(-\infty, -4)$
D) Increasing: $(-\infty, -4)$; decreasing: $(-4, \infty)$

Answer: C

100) $g(x) = 2 - (x - 5)^2$

A) Increasing: $(-\infty, 5)$; decreasing: $(5, \infty)$
B) Increasing: $(-\infty, -5)$; decreasing: $(-5, \infty)$
C) Increasing: $(2, \infty)$; decreasing: $(-\infty, 2)$
D) Increasing: $(-\infty, 2)$; decreasing: $(2, \infty)$

Answer: A

101) $f(x) = x^3 - x^2 + 2$

A) Increasing: $(-\infty, 0)$ and $(0.67, \infty)$; decreasing: $(0, 0.67)$
B) Increasing: $(0, 0.67)$; decreasing: $(-\infty, 0)$ and $(0.67, \infty)$
C) Increasing: $(-\infty, -2)$ and $(2, \infty)$; decreasing: $(-2, 2)$
D) Increasing: $(-\infty, 0)$ and $(0.67, \infty)$; constant: $(0, 0.67)$

Answer: A

102) $g(x) = 1.25(x + 8)^2$

A) Increasing: $(-\infty, -8)$; decreasing: $(-8, \infty)$
B) Increasing: $(-8, \infty)$; decreasing: $(-\infty, -8)$
C) Increasing: $(8, \infty)$; decreasing: $(-\infty, 8)$
D) Increasing: $(-\infty, 8)$; decreasing: $(8, \infty)$

Answer: B

103) $g(x) = 3 - (x + 8)^2$

A) Decreasing: $(-8, \infty)$; decreasing: $(-\infty, -8)$
B) Increasing: $(-\infty, 8)$; decreasing: $(8, \infty)$;
C) Increasing: $(8, \infty)$; decreasing: $(-\infty, 8)$
D) Increasing: $(-\infty, -8)$; decreasing: $(-8, \infty)$

Answer: D

Determine if the function is bounded above, bounded below, bounded on its domain, or unbounded on its domain.

104) $y = 30$

A) Unbounded
B) Bounded below
C) Bounded above
D) Bounded

Answer: D

105) $y = 1 - x^2$

A) Bounded above
B) Bounded domain
C) Unbounded
D) Bounded below

Answer: A

106) $y = 7^x + 5$

A) Bounded
B) Bounded below
C) Unbounded
D) Bounded above

Answer: B

107) $y = \sqrt{2 - x^2}$

A) Bounded above
B) Bounded below
C) Unbounded
D) Bounded

Answer: D

108) $y = 4^{-x} + 6$

A) Bounded above B) Bounded below C) Bounded D) Unbounded

Answer: B

109) $y = 9x - x^3$

A) Bounded below B) Bounded above C) Bounded D) Unbounded

Answer: D

Solve the problem.

110) Estimate graphically the local maximum and local minimum of $f(x) = 2x^2 + 3x + 5$.

A) Local maximum: 3.88; local minimum: -0.75 B) Local maximum: 3.88; no local minimum

C) No local maximum; local minimum: -0.75 D) No local maximum; local minimum: 3.88

Answer: D

111) Determine graphically the local maximum and local minimum of $f(x) = -3x^{2/3} - 2$.

A) Local maximum: -2; local minimum: $-\infty$ B) No local maximum; local minimum: -2

C) Local maximum: 0; no local minimum D) Local maximum: -2; no local minimum

Answer: D

112) Estimate graphically the local maximum and local minimum of $f(x) = \frac{1}{3}x^3 + x^2 - 3x$.

A) Local maximum: 8.53; local minimum: -2.01 B) Local maximum: 1.67; local minimum: -9

C) Local maximum: 9; local minimum: -1.67 D) Local maximum: 9; local minimum: 1.06

Answer: C

113) Estimate graphically the local maximum and local minimum of $f(x) = 0.02x^5 - 0.04x^4 - 0.06x^3 + 1.46x^2 + 1$.

A) Local maximum: 9.20; local minimum: 1.06 B) Local maximum: -2.79; local minimum: 0

C) Local maximum: 8.65; local minimum 0.91 D) Local maximum: 7.86; local minimum: 1

Answer: D

114) Estimate graphically the local maximum and local minimum of $f(x) = 0.0001x^4 - 0.1x^2 + 0.1$.

A) Local maximum: 0.1; local minima: ±24.9 B) Local maximum: 0; no local minimum

C) Local maximum: 0.1; no local minimum D) Local maximum: 0; local minima: ±22.4

Answer: D

115) Estimate graphically the local maximum and local minimum of $f(x) = x\sqrt{x+2}$.

A) No local maximum; local minimum: -.35 B) Local maximum: -.35; no local minimum

C) No local maximum; local minimum: -1.09 D) Local maximum: -.35; local minimum: -1.09

Answer: C

116) Estimate graphically the local maximum and local minimum for $f(x) = x|3x - 2|$.

A) Local maximum: .33; no local minimum B) No local maximum; local minimum: .05

C) Local maximum: .05; local minimum: .33 D) Local maximum: .33; local minimum: .67

Answer: D

Determine algebraically whether the function is even, odd, or neither even nor odd.

117) $f(x) = 3x^2 - 4$

A) Neither B) Odd C) Even

Answer: C

118) $f(x) = -5x^3 + 3x$

A) Even B) Neither C) Odd

Answer: C

119) $f(x) = 4x^5 - 3x^3$

A) Neither B) Odd C) Even

Answer: B

120) $f(x) = -0.91x^2 + |x| + 6$

A) Neither B) Odd C) Even

Answer: C

121) $f(x) = 4x^4 + 6x - 3$

A) Even B) Neither C) Odd

Answer: B

122) $f(x) = x + \frac{20}{x}$

A) Neither B) Odd C) Even

Answer: B

123) $f(x) = 20\sqrt[3]{x}$

A) Neither B) Even C) Odd

Answer: C

124) $f(x) = \frac{28}{x^2}$

A) Neither B) Even C) Odd

Answer: B

125) $f(x) = 13x - 8|x|$

A) Even B) Odd C) Neither

Answer: C

126) $f(x) = -4$

A) Odd B) Even C) Neither

Answer: B

127) $f(x) = \sqrt{x^2 + 6}$

A) Odd B) Even C) Neither

Answer: B

Find the asymptote(s) of the given function.

128) $f(x) = \frac{x - 4}{x^2 + 1}$ vertical asymptotes(s)

A) None B) $x = -1$ C) $x = 1$ D) $x = 2, x = -2$

Answer: A

129) $h(x) = \frac{(x - 5)(x + 6)}{x^2 - 4}$ vertical asymptotes(s)

A) None B) $x = 2, x = -2$ C) $x = 5, x = -6$ D) $x = -5, x = 6$

Answer: B

130) $f(x) = \frac{x - 3}{x^2 - 36}$ vertical asymptotes(s)

A) $x = -6$ B) $x = 3$ C) $x = 6, x = -6$ D) $x = 6$

Answer: C

131) $f(x) = \frac{x - 7}{x^2 + 6x}$ vertical asymptotes(s)

A) $x = 6$ B) $x = 0, x = -6$ C) $x = -6$ D) $x = 7$

Answer: B

132) $g(x) = \frac{x - 2}{(x - 2)(x + 5)}$ vertical asymptotes(s)

A) $x = -2$ B) $x = -2, x = 5$ C) $x = 2, x = -5$ D) $x = 2$

Answer: C

133) $f(x) = \frac{4x^2 + 5}{4x^2 - 5}$ horizontal asymptotes(s)

A) $y = 1$ B) $y = -5$ C) $y = 5$ D) None

Answer: A

134) $g(x) = \frac{x^2 + 1x - 3}{x - 3}$ horizontal asymptotes(s)

A) $y = -1$ B) None C) $y = 3$ D) $y = 9$

Answer: B

135) $g(x) = \frac{x + 2}{x^2 - 7}$ horizontal asymptotes(s)

A) $y = 7$ B) $y = 0$ C) None D) $y = -2$

Answer: B

136) $h(x) = \frac{18x^2}{6x^2 - 6}$ horizontal asymptotes(s)

A) None B) $y = 3$ C) $y = 6$ D) $y = \sqrt{6}$

Answer: B

137) $f(x) = 3.1^x$ horizontal asymptotes(s)

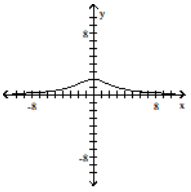
A) y = 3.1 B) None C) x = 0 D) y = 0

Answer: D

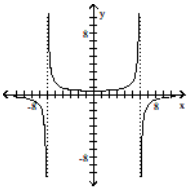
Match the equation with the appropriate graph.

138) $f(x) = \frac{18}{x^2 - 9}$

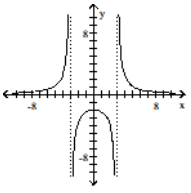
A)



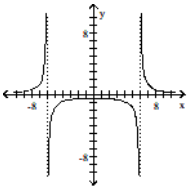
B)



C)



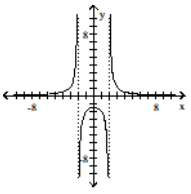
D)



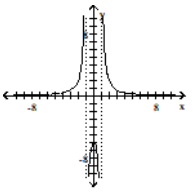
Answer: C

139) $f(x) = \dfrac{6}{x^2 + 1}$

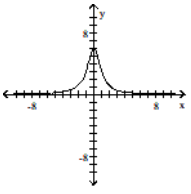
A)



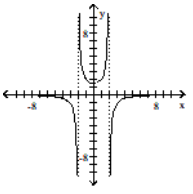
B)



C)



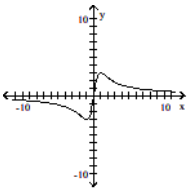
D)



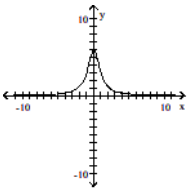
Answer: C

140) $f(x) = \dfrac{6x}{x^2 - 1}$

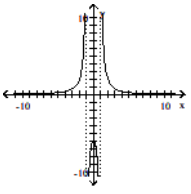
A)



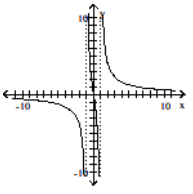
B)



C)



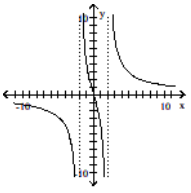
D)



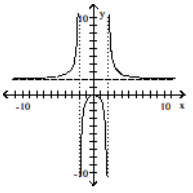
Answer: D

141) $f(x) = \dfrac{2x^2}{x^2 - 4}$

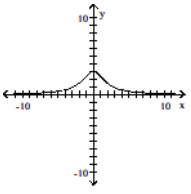
A)



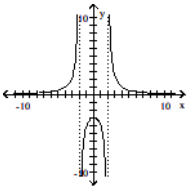
B)



C)



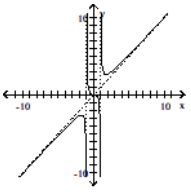
D)



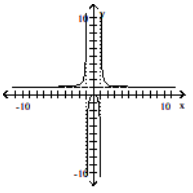
Answer: B

142) $f(x) = \dfrac{x^3}{x^2 - 1}$

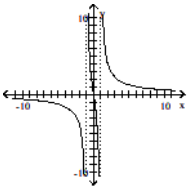
A)



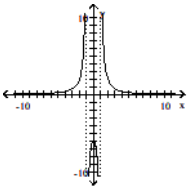
B)



C)



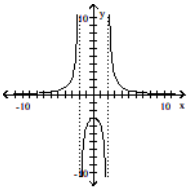
D)



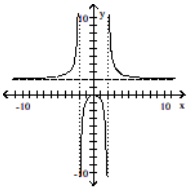
Answer: A

143) $f(x) = \dfrac{x^3}{x^2 + 4}$

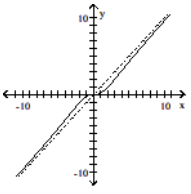
A)



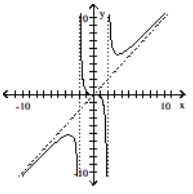
B)



C)



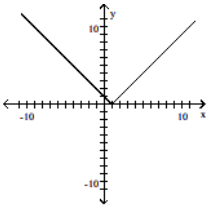
D)



Answer: C

Match the function with the graph.

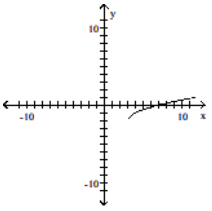
144)



A) $y = |x - 1| + 3$ B) $y = |x + 1|$ C) $y = |x| - 1$ D) $y = |x - 1|$

Answer: D

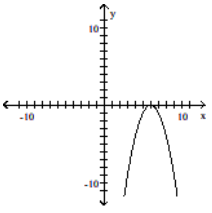
145)



A) $y = \sqrt{x + 3}$ B) $y = \sqrt{x - 3}$ C) $y = \sqrt{x - 3} - 2$ D) $y = \sqrt{x} - 2$

Answer: C

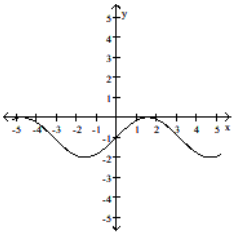
146)



A) $g(x) = -x^2 + 6$ B) $g(x) = (x + 6)^2$ C) $g(x) = -x^2 - 6$ D) $g(x) = -(x - 6)^2$

Answer: D

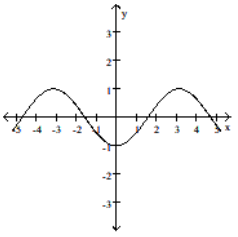
147)



A) $y = \sin x + 1$ B) $y = \cos x - 1$ C) $y = \cos (x + 1)$ D) $y = \sin x - 1$

Answer: D

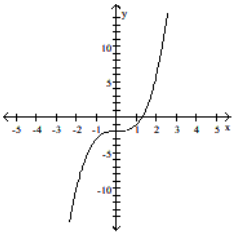
148)



A) $y = -\cos x$ B) $y = \cos x$ C) $y = -\sin x$ D) $y = \sin x$

Answer: A

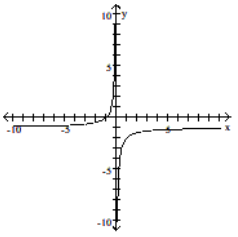
149)



A) $y = (x - 2)^3$ B) $y = x^3 - 2$ C) $y = x^3 + 2$ D) $y = x^3$

Answer: B

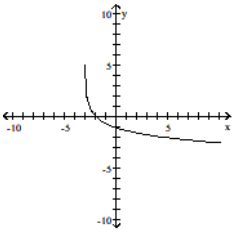
150)



A) $y = -\frac{1}{x} - 1$ B) $y = -\frac{1}{x} + 1$ C) $y = -\frac{1}{x}$ D) $y = \frac{1}{x} - 1$

Answer: A

151)



A) $y = -\ln(x - 3)$ B) $y = \ln x + 3$ C) $y = -\ln(x + 3)$ D) $y = -\ln(x)$

Answer: C

Identify which of the twelve basic functions listed below fit the description given.

$y = x$, $y = x^2$, $y = x^3$, $y = |x|$, $y = \frac{1}{x}$, $y = e^x$, $y = \sqrt{x}$, $y = \ln x$, $y = \sin x$, $y = \cos x$, $y = \text{int}(x)$, $y = \frac{1}{1 + e^{-x}}$

152) The three functions that are even

A) $y = x^2$, $y = \cos x$, $y = |x|$ B) $y = x$, $y = x^2$, $y = x^3$

C) $y = x$, $y = \frac{1}{x}$, $y = x^3$ D) $y = \cos x$, $y = \sin x$, $y = |x|$

Answer: A

153) The four functions that are increasing on the interval $(-\infty, 0)$

A) $y = x, y = x^3, y = x^2, y = e^x$

B) $y = x, y = x^3, y = e^x, y = \frac{1}{1 + e^{-x}}$

C) $y = x, y = x^3, y = x^2, y = \frac{1}{1 + e^{-x}}$

D) $y = x^3, y = \frac{1}{x}, y = |x|, y = x$

Answer: B

154) The one function that is decreasing from $(0, \infty)$

A) $y = \frac{1}{x}$ B) $y = |x|$ C) $y = \ln x$ D) $y = \frac{1}{1 + e^{-x}}$

Answer: A

155) The four functions with local minima

A) $y = x^2, y = x^3, y = \sin x, y = \cos x$

B) $y = \sqrt{x}, y = \sin x, y = \cos x, y = x^2$

C) $y = x^2, y = \sin x, y = \cos x, y = |x|$

D) $y = \sin x, y = \cos x, y = |x|, y = \frac{1}{1 + e^{-x}}$

Answer: C

156) The two functions with infinitely many zeros

A) $y = \sin x, y = \frac{1}{x}$

B) $y = \sin x, y = \cos x$

C) $y = \frac{1}{x}, y = e^x$

D) $y = \frac{1}{1 + e^{-x}}, y = \text{int}(x)$

Answer: B

157) The two functions with bounded domains

A) $y = \sqrt{x}, y = \frac{1}{1 + e^{-x}}$

B) $y = e^x, y = \ln x$

C) $y = \sin x, y = \cos x$

D) $y = \sqrt{x}, y = \ln x$

Answer: D

158) The two functions that have end behavior $\lim_{x \to -\infty} f(x) = +\infty$

A) $y = |x|, y = e^x$ B) $y = x^2, y = |x|$ C) $y = x^2, y = \text{int}(x)$ D) $y = x^2, y = x^3$

Answer: B

159) The three functions with end behavior $\lim_{x \to -\infty} f(x) = -\infty$

A) $y = x, y = \frac{1}{1 + e^{-x}}, y = \text{int}(x)$

B) $y = x, y = x^3, y = \frac{1}{1 + e^{-x}}$

C) $y = x, y = x^3, y = \text{int}(x)$

D) $y = x^2, y = x^3, y = \text{int}(x)$

Answer: C

160) The three functions that are bounded above

A) $y = \ln x$, $y = \sqrt{x}$, $y = \dfrac{1}{1 + e^{-x}}$

B) $y = \sin x$, $y = \cos x$, $y = \text{int}(x)$

C) $y = \sin x$, $y = \cos x$, $y = \dfrac{1}{1 + e^{-x}}$

D) $y = \sin x$, $y = \cos x$, $y = \ln x$

Answer: C

161) The four functions whose graphs look the same turned upside down

A) $y = \sin x$, $y = \cos x$, $y = x$, $y = x^3$

B) $y = x$, $y = x^3$, $y = \dfrac{1}{x}$, $y = \sin x$

C) $y = x$, $y = \dfrac{1}{x}$, $y = \sin x$, $y = \dfrac{1}{1 + e^{-x}}$

D) $y = x$, $y = x^3$, $y = \dfrac{1}{x}$, $y = \cos x$

Answer: B

Graph the function on your calculator to determine the domain and range from the graph.

162) $h(x) = |x - 6|$

A) Domain: $[0, \infty)$; range: $(-\infty, \infty)$

B) Domain: $(-\infty, \infty)$; range: $[6, \infty)$

C) Domain: $[6, \infty)$; range: $[0, \infty)$

D) Domain: $(-\infty, \infty)$; range: $[0, \infty)$

Answer: D

163) $g(x) = \ln (x - 7)$

A) Domain: $(7, \infty)$; range: $(-\infty, \infty)$

B) Domain: $[7, \infty)$; range: $(-\infty, \infty)$

C) Domain: $(-\infty, \infty)$; range: $(-\infty, \infty)$

D) Domain: $(-\infty, \infty)$; range: $(7, \infty)$

Answer: A

164) $f(x) = \dfrac{1}{x} + 2$

A) Domain: $(-\infty, \infty)$; range: $(-\infty, 0) \cup (0, \infty)$

B) Domain: $(-\infty, 0) \cup (0, \infty)$; range: $(-\infty, 0) \cup (0, \infty)$

C) Domain: $(-\infty, \infty)$; range: $(-\infty, \infty)$

D) Domain: $(-\infty, 0) \cup (0, \infty)$; range: $(-\infty, 2) \cup (2, \infty)$

Answer: D

165) $p(x) = (x + 7)^2$

A) Domain: $(-\infty, \infty)$; range: [<a>, ∞)

B) Domain: $[-7, \infty)$; range: $(-\infty, \infty)$

C) Domain: $(-\infty, \infty)$; range: $[0, \infty)$

D) Domain: $[0, \infty)$; range: $(-\infty, \infty)$

Answer: C

166) $r(x) = \sqrt{x + 6}$

A) Domain: $[-6, \infty)$; range: $[0, \infty)$

B) Domain: $[-6, \infty)$; range: $(-\infty, \infty)$

C) Domain: $[0, \infty)$; range: $[-6, \infty)$

D) Domain: $(-6, \infty)$; range: $(0, \infty)$

Answer: A

167) $q(x) = \sin (x) + 2$

A) Domain: $(-\infty, \infty)$; range: $[-1, 1]$

B) Domain: $[1, 3]$; range: $(-\infty, \infty)$

C) Domain: $(-\infty, \infty)$; range: $(1, 3)$

D) Domain: $(-\infty, \infty)$; range: $[1, 3]$

Answer: D

168) $k(x) = e^x - 3$

A) Domain: $(-3, \infty)$; range: $(-\infty, \infty)$
B) Domain: $(-\infty, \infty)$; range: $[-3, \infty)$
C) Domain: $(-\infty, -3)$; range: $(-\infty, \infty)$
D) Domain: $(-\infty, \infty)$; range: $(-3, \infty)$

Answer: D

169) $h(x) = |x| - 7$

A) Domain: $[-7, \infty)$; range: $(-\infty, \infty)$
B) Domain: $(-\infty, \infty)$; range: $(-7, \infty)$
C) Domain: $(-7, \infty)$; range: $(-\infty, \infty)$
D) Domain: $(-\infty, \infty)$; range: $[-7, \infty)$

Answer: D

170) $g(x) = 4 \cos x$

A) Domain: $(-\infty, \infty)$; range: $[-1, 1]$
B) Domain: $[-4, 4]$; range: $(-\infty, \infty)$
C) Domain: $(-\infty, \infty)$; range: $(-\infty, \infty)$
D) Domain: $(-\infty, \infty)$; range: $[-4, 4]$

Answer: D

171) $g(x) = \dfrac{1}{1 + e^{-x}} - 3$

A) Domain: $(-\infty, \infty)$; range: $(-3, -2)$
B) Domain: $(-\infty, \infty)$; range: $(-\infty, -2]$
C) Domain: $(-\infty, \infty)$; range: $(-\infty, \infty)$
D) Domain: $(0, \infty)$; range: $[-3, -2]$

Answer: A

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Graph the function on your calculator in order to answer the following questions:
On what intervals is the function increasing? decreasing?
Is the function odd, even, or neither?
Give the function's extrema, if any.
Find the horizontal asymptotes, if any.
How does the graph relate to a graph of one of the twelve basic functions?

172) $f(x) = \ln(x + 3)$

Answer: Increasing on $(-3, \infty)$
Neither odd nor even
No extrema
No horizontal asymptotes
Graph is graph of $f(x) = \ln x$ shifted 3 units to the left

173) $f(x) = 4 - \sqrt{x}$

Answer: Decreasing on $[0, \infty)$
Neither odd nor even
No extrema
No horizontal asymptotes
Graph is graph of $f(x) = \sqrt{x}$ reflected across the x-axis and shifted 4 units upward

174) $f(x) = -\dfrac{1}{1 + e^{-x}}$

Answer: Decreasing on $(-\infty, \infty)$
Neither odd nor even
No extrema
Horizontal asymptotes: $y = 0$ and $y = -1$
Graph is graph of $f(x) = \dfrac{1}{1 + e^{-x}}$ reflected across the x-axis

175) $f(x) = 4 | x |$

Answer: Decreasing on $(-\infty, 0)$, increasing on $(0, \infty)$
Even
Local minimum at $x = 0$
No horizontal asymptotes
Graph is graph of $f(x) = | x |$ stretched vertically by a factor of 4

176) $f(x) = e^{-x}$

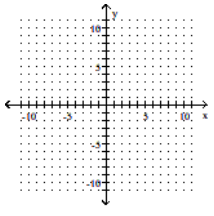
Answer: Decreasing on $(-\infty, \infty)$
Neither odd nor even
No extrema
Horizontal asymptote: $y = 0$
Graph is graph of $f(x) = e^{x}$ reflected across the y-axis

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

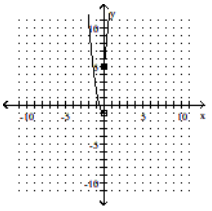
Graph the piecewise-defined function.

177)

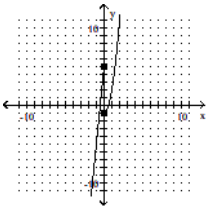
$$y(x) = \begin{cases} 10x + 5, \text{ if } x < 0 \\ 5x^2 - 1, \text{ if } x \geq 0 \end{cases}$$



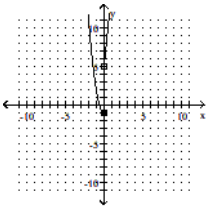
A)



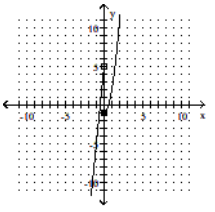
B)



C)



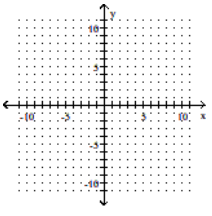
D)



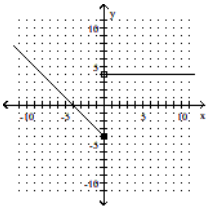
Answer: D

178)

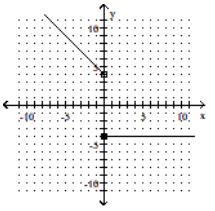
$$f(x) = \begin{cases} |x| - 4, \text{ if } x < 0 \\ -4, \text{ if } x \geq 0 \end{cases}$$



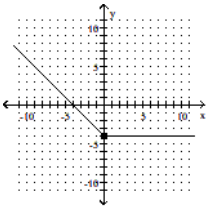
A)



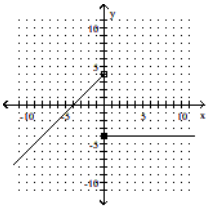
B)



C)

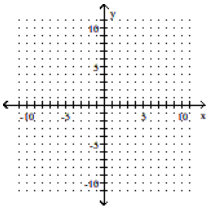


D)

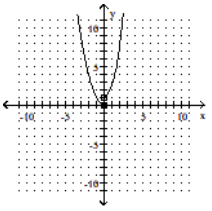


Answer: C

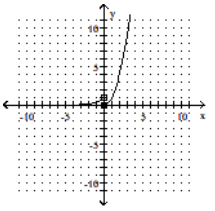
179) $g(x) = \begin{cases} x^2 & \text{if } x \le 0 \\ e^x & \text{if } x > 0 \end{cases}$



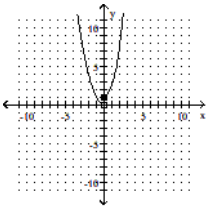
A)



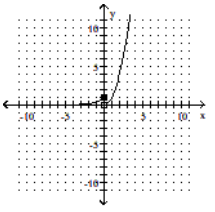
B)



C)

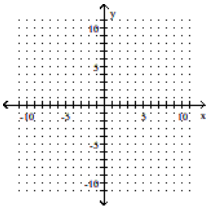


D)

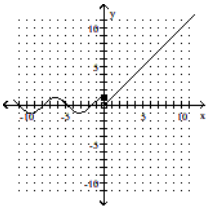


Answer: A

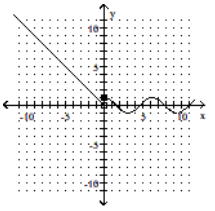
180) $f(x) = \begin{cases} |x| & \text{if } x < 0 \\ \cos x & \text{if } x \geq 0 \end{cases}$



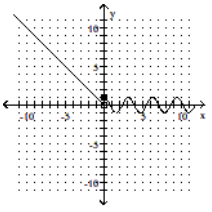
A)



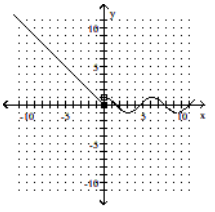
B)



C)

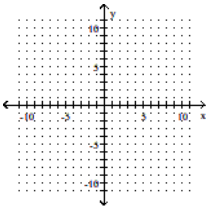


D)

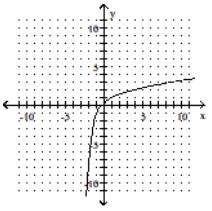


Answer: B

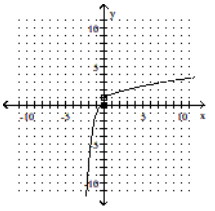
181) $h(x) = \begin{cases} x^3 & \text{if } x < 0 \\ \sqrt{x} & \text{if } x \geq 0 \end{cases}$



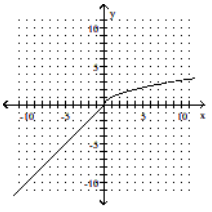
A)



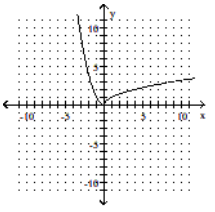
B)



C)

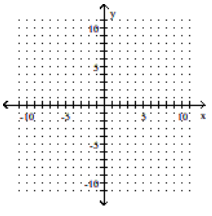


D)

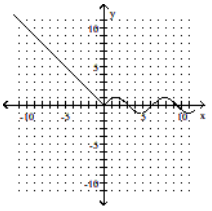


Answer: A

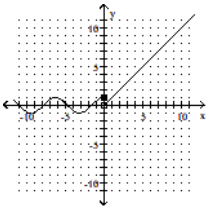
182) $f(x) = \begin{cases} \sin x \text{ if } x \le 0 \\ |x| \text{ if } x > 0 \end{cases}$



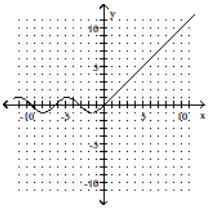
A)



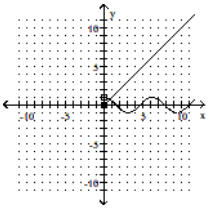
B)



C)

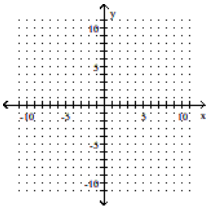


D)

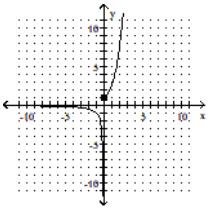


Answer: C

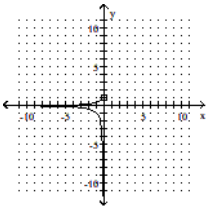
183) $g(x) = \begin{cases} \frac{1}{x} & \text{if } x < 0 \\ e^x & \text{if } x \geq 0 \end{cases}$



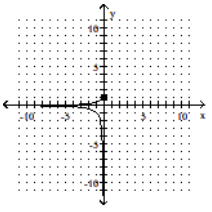
A)



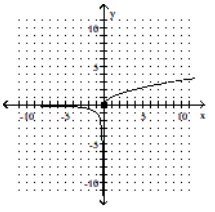
B)



C)



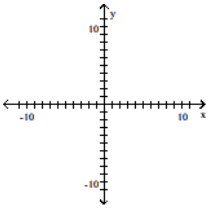
D)



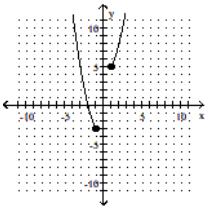
Answer: A

184)

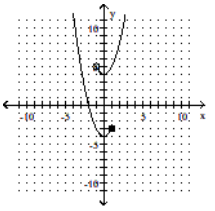
$$g(x) = \begin{cases} x^2 - 4, \text{ if } x < -1 \\ 1, \text{ if } -1 \le x \le 1 \\ x^2 + 4, \text{ if } x > 1 \end{cases}$$



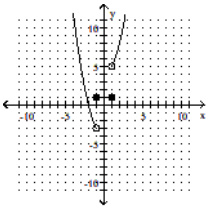
A)



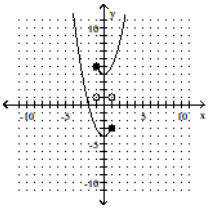
B)



C)



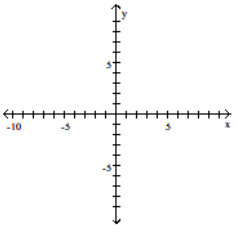
D)



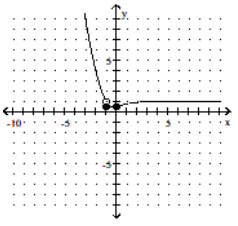
Answer: C

185)

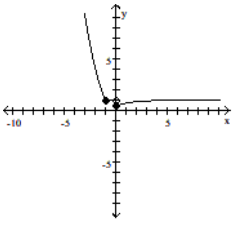
$$f(x) = \begin{cases} x^2 & \text{if } x < -1 \\ \frac{1}{2} & \text{if } -1 \le x < 0 \\ \frac{1}{1+e^{-x}} & \text{if } x \ge 0 \end{cases}$$



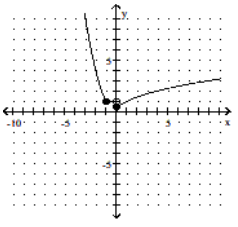
A)



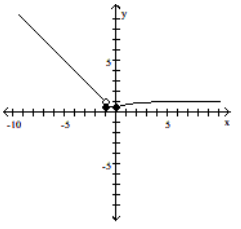
B)



C)



D)



Answer: A

Perform the requested operation or operations. Find the domain of each.

186) $f(x) = \sqrt{3x + 4}$, $g(x) = \sqrt{4x - 16}$

Find fg.

A) $(3x + 4)(2x - 4)$; domain: $(-\infty,\infty)$

B) $(\sqrt{3x + 4})(\sqrt{4x - 16})$; domain: $[4,\infty)$

C) $(2x - 4)(\sqrt{3x + 4})$; domain: $\left[-\frac{4}{3},\infty\right)$

D) $(3x + 4)(4x - 16)$; domain: $(-\infty,\infty)$

Answer: B

187) $f(x) = 2x + 7$, $g(x) = 6x^2$

Find (fg)(x).

A) $12x^3 + 42x^2$; domain: $(-\infty,\infty)$

B) $12x + 42$; domain: $(-\infty,\infty)$

C) $6x^2 + 2x + 7$; domain: $(-\infty,\infty)$

D) $12x^2 + 42x$; domain: $(-\infty,\infty)$

Answer: A

188) $f(x) = 4x + 8$, $g(x) = 4x^2$
Find $(f + g)(x)$.

A) $4x + 8 + 4x^2$; domain: $(-\infty,\infty)$

B) $4x + 8 - 4x^2$; domain: $(-\infty,\infty)$

C) $\frac{4x + 8}{4x^2}$; domain: $(-\infty,\infty)$

D) $16x^3 + 32x$; domain: $(-\infty,\infty)$

Answer: A

189) $f(x) = \sqrt{6x + 6}$, $g(x) = \sqrt{6x - 6}$
Find $(f + g)(x)$.

A) $\sqrt{12x}$; domain: $[0,\infty)$

B) $x\sqrt{12}$; domain: $(-\infty,\infty)$

C) $6x$; domain: $(-\infty,\infty)$

D) $\sqrt{6x + 6} + \sqrt{6x - 6}$; domain: $[1,\infty)$

Answer: D

190) $f(x) = \sqrt{x + 6}$; $g(x) = \cos x$
Find $f - g$.

A) $\sqrt{x + 6} + \cos x$; domain: $[-6, \infty)$

B) $\frac{\cos x}{\sqrt{x + 6}}$; domain: $[-6, \infty)$

C) $(\cos x)(\sqrt{x + 6})$; domain: $[-6, \infty)$

D) $\sqrt{x + 6} - \cos x$; domain: $[-6, \infty)$

Answer: D

191) $f(x) = \sqrt{x + 8}$ and $g(x) = |x - 6|$
Find fg.

A) $|x - 6|\sqrt{x + 8}$; domain: $(6, \infty)$

B) $\sqrt{x^2 + 2x - 48}$; domain: $(-\infty, -8) \cup (6, \infty)$

C) $|x^2 + 2x - 48|$; domain: $(-\infty, \infty)$

D) $|x - 6|\sqrt{x + 8}$; domain: $(-8, \infty)$

Answer: D

192) $f(x) = 5x + 4$; $g(x) = 4x - 5$
Find f/g.

A) $(f/g)(x) = \frac{5x + 4}{4x - 5}$; domain $\{x | x \neq -\frac{4}{5}\}$

B) $(f/g)(x) = \frac{5x + 4}{4x - 5}$; domain $\{x | x \neq \frac{5}{4}\}$

C) $(f/g)(x) = \frac{4x - 5}{5x + 4}$; domain $\{x | x \neq \frac{5}{4}\}$

D) $(f/g)(x) = \frac{4x - 5}{5x + 4}$; domain $\{x | x \neq -\frac{4}{5}\}$

Answer: B

193) $f(x) = \sqrt{x}$; $g(x) = 6x - 7$
Find f/g.

A) $(f/g)(x) = \frac{\sqrt{x}}{6x - 7}$; domain $\{x | x \geq 0, x \neq \frac{7}{6}\}$

B) $(f/g)(x) = \frac{6x - 7}{\sqrt{x}}$; domain $\{x | x \geq 0\}$

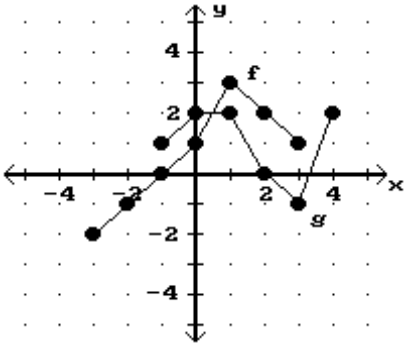
C) $(f/g)(x) = \frac{\sqrt{x}}{6x - 7}$; domain $\{x | x \neq 0\}$

D) $(f/g)(x) = \frac{\sqrt{x}}{6x - 7}$; domain $\{x | x \neq \frac{7}{6}\}$

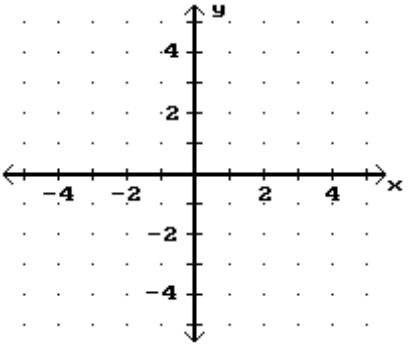
Answer: A

Consider the functions f and g as shown in the graph. Sketch the graph of the indicated sum or difference of functions.

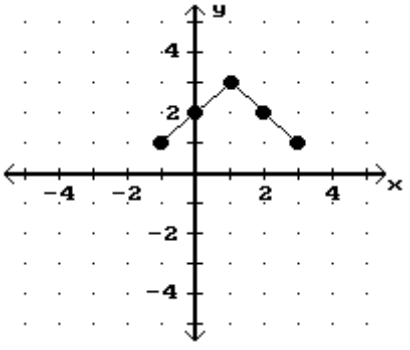
194) Graph f + g.



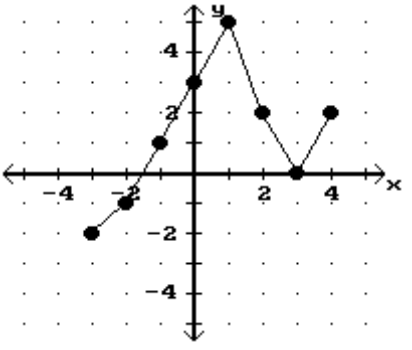
A)



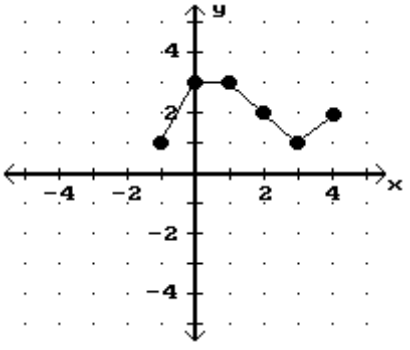
B)

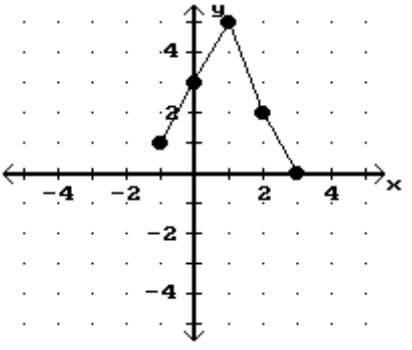


C)



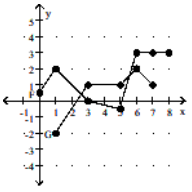
D)

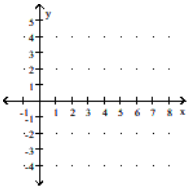




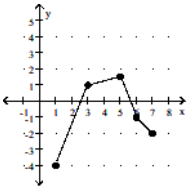
Answer: D

195) Graph f - g.

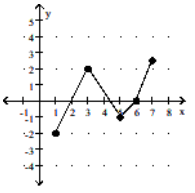




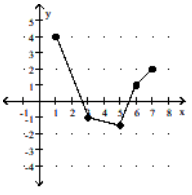
A)



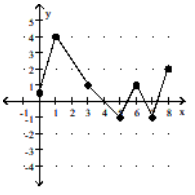
B)



C)

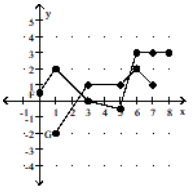


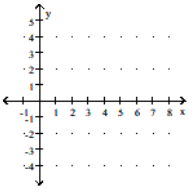
D)



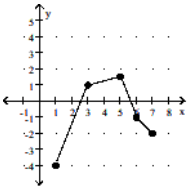
Answer: C

196) Graph g - f.

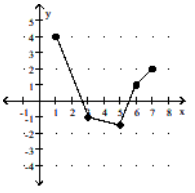




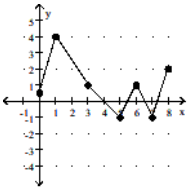
A)



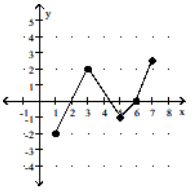
B)



C)



D)



Answer: A

Perform the requested operation or operations.

197) f(x) = 4x + 10; g(x) = 3x - 1

Find f(g(x)).

A) f(g(x)) = 12x + 9 B) f(g(x)) = 12x + 6 C) f(g(x)) = 12x + 29 D) f(g(x)) = 12x + 14

Answer: B

198) f(x) = $\sqrt{x + 2}$; g(x) = 8x - 6

Find f(g(x)).

A) f(g(x)) = $2\sqrt{2x - 1}$ B) f(g(x)) = $8\sqrt{x - 4}$

C) f(g(x)) = $2\sqrt{2x + 1}$ D) f(g(x)) = $8\sqrt{x + 2}$ - 6

Answer: A

199) $f(x) = 4x + 9;\ g(x) = 2x - 1$, find $f(g(x))$.

A) $f(g(x)) = 8x + 8$ B) $f(g(x)) = 8x + 17$ C) $f(g(x)) = 8x + 5$ D) $f(g(x)) = 8x + 13$

Answer: C

200) $f(x) = \frac{x - 9}{5};\ g(x) = 5x + 9$, find $g(f(x))$.

A) $g(f(x)) = 5x + 36$ B) $g(f(x)) = x$ C) $g(f(x)) = x - \frac{9}{5}$ D) $g(f(x)) = x + 18$

Answer: B

201) $f(x) = \sqrt{x + 4};\ g(x) = 8x - 8$, find $f(g(x))$.

A) $f(g(x)) = 2\sqrt{2x - 1}$ B) $f(g(x)) = 8\sqrt{x - 4}$

C) $f(g(x)) = 2\sqrt{2x + 1}$ D) $f(g(x)) = 8\sqrt{x + 4} - 8$

Answer: A

202) $f(x) = 4x^2 + 5x + 4;\ g(x) = 5x - 6$, find $g(f(x))$.

A) $g(f(x)) = 4x^2 + 5x - 2$ B) $g(f(x)) = 4x^2 + 25x + 14$

C) $g(f(x)) = 20x^2 + 25x + 14$ D) $g(f(x)) = 20x^2 + 25x + 26$

Answer: C

203) $f(x) = x^2 + 8$; $g(x) = \sqrt{x - 3}$

Find $f(g(x))$.

A) $f(g(x)) = x + 5$ B) $f(g(x)) = \frac{\sqrt{x - 3}}{x^2 + 8}$

C) $f(g(x)) = (x^2 + 8)(\sqrt{x - 3})$ D) $f(g(x)) = \sqrt{x^2 + 5}$

Answer: A

204) $f(x) = x^2 + 9$; $g(x) = \sqrt{x - 1}$

Find $g(f(x))$.

A) $g(f(x)) = (\sqrt{x - 1})(x^2 + 9)$ B) $g(f(x)) = \sqrt{x^2 + 8}$

C) $g(f(x)) = \frac{\sqrt{x - 1}}{x^2 + 9}$ D) $g(f(x)) = x + 8$

Answer: B

205) $f(x) = \frac{1}{x - 6}$; $g(x) = \sqrt{x}$

Find $f(g(x))$.

A) $f(g(x)) = (x - 6)\sqrt{x}$ B) $f(g(x)) = \frac{\sqrt{x}}{x - 6}$ C) $f(g(x)) = \frac{1}{\sqrt{x} - 6}$ D) $f(g(x)) = \sqrt{\frac{1}{x - 6}}$

Answer: C

206) f(x) = f(x) = $\frac{1}{x - 4}$; g(x) = $\sqrt{x}$

Find g(f(x)).

A) g(f(x)) = $\frac{\sqrt{x}}{x - 4}$ B) g(f(x)) = $(x - 4)\sqrt{x}$ C) g(f(x)) = $\sqrt{\frac{1}{x - 4}}$ D) g(f(x)) = $\frac{1}{\sqrt{x} - 4}$

Answer: C

Find f(x) and g(x) so that the function can be described as y = f(g(x)).

207) y = $\frac{1}{x^2 - 4}$

A) f(x) = $\frac{1}{4}$, g(x) = $x^2 - 4$ B) f(x) = $\frac{1}{x}$, g(x) = $x^2 - 4$

C) f(x) = $\frac{1}{x^2}$, g(x) = x - 4 D) f(x) = $\frac{1}{x^2}$, g(x) = - 1/4

Answer: B

208) y = |5x + 10|

A) f(x) = |-x|, g(x) = 5x - 10 B) f(x) = x, g(x) = 5x + 10

C) f(x) = - |x|, g(x) = 5x + 10 D) f(x) = |x|, g(x) = 5x + 10

Answer: D

209) y = $\frac{7}{x^2}$ + 9

A) f(x) = x, g(x) = $\frac{7}{x}$ + 9 B) f(x) = $\frac{7}{x^2}$, g(x) = 9

C) f(x) = $\frac{1}{x}$, g(x) = $\frac{7}{x}$ + 9 D) f(x) = x + 9, g(x) = $\frac{7}{x^2}$

Answer: D

210) y = $\frac{3}{\sqrt{8x + 4}}$

A) f(x) = 3, g(x) = $\sqrt{8 + 4}$ B) f(x) = $\sqrt{8x + 4}$, g(x) = 3

C) f(x) = $\frac{3}{x}$, g(x) = 8x + 4 D) f(x) = $\frac{3}{\sqrt{x}}$, g(x) = 8x + 4

Answer: D

211) y = $(9x - 16)^7$

A) f(x) = x^7, g(x) = 9x - 16 B) f(x) = $(9x)^7$, g(x) = -16

C) f(x) = 9x - 16, g(x) = x^7 D) f(x) = $9x^7$, g(x) = x - 16

Answer: A

212) $y = \sqrt{25x^2 + 3}$

A) $f(x) = \sqrt{x}$, $g(x) = 25x^2 + 3$

B) $f(x) = \sqrt{25x^2}$, $g(x) = \sqrt{3}$

C) $f(x) = 25x^2 + 3$, $g(x) = \sqrt{x}$

D) $f(x) = \sqrt{25x + 3}$, $g(x) = x^2$

Answer: A

Solve the problem.

213) A high-altitude spherical weather balloon expands as it rises due to the drop in atmospheric pressure. Suppose that the radius r increases at the rate of 0.04 inches per second and that r = 33 inches at time t = 0. Determine the equation that models the volume V of the balloon at time t and find the volume when t= 310 seconds.

A) $V(t) = \frac{4\pi(0.04t)^3}{3}$; 23,959.34 in.^{3}

B) $V(t) = \frac{4\pi(33 + 0.04t)^3}{3}$; 391,973.01 in.^{3}

C) $V(t) = 4\pi(33+0.04t)^2$; 1,306,170.68 in.^{3}

D) $V(t) = 4\pi(0.04t)^2$; 1932.21 in.^{3}

Answer: B

214) A satellite camera takes a rectangular-shaped picture. The smallest region that can be photographed is a 4-km by 6-km rectangle. As the camera zooms out, the length l and width w of the rectangle increase at a rate of 3 km/sec. How long does it take for the area A to be at least 4 times its original size?

A) 1.61 sec B) 9.7 sec C) 4.94 sec D) 3.28 sec

Answer: A

Find two functions defined implicitly by the given relation.

215) $x^2 + y^2 = 81$

A) $y = \sqrt{81} + x$ or $y = \sqrt{81} - x$

B) $y = \sqrt{81 - x^2}$ or $y = \sqrt{81 + x^2}$

C) $y = \sqrt{81} + x$ or $y = -\sqrt{81} - x$

D) $y = \sqrt{81 - x^2}$ or $y = -\sqrt{81 - x^2}$

Answer: D

216) $x + y^2 = 64$

A) $y = \sqrt{64- x}$ or $y = \sqrt{64 + x}$

B) $y = \sqrt{64 - x}$ or $y = -\sqrt{64 - x}$

C) $y = 64 - x$ or $y = 64 + x$

D) $y = 64 - x$ or $y = -64 + x$

Answer: B

217) $x^2 - y^2 = 100$

A) $y = \sqrt{x^2 - 100}$ or $y = \sqrt{x^2 + 100}$

B) $y = +(x - \sqrt{100})$ or $y = -(x - \sqrt{100})$

C) $y = +\sqrt{x^2 - 100}$ or $y = -\sqrt{x^2 - 100}$

D) $y = x - \sqrt{100}$ or $y = x + \sqrt{100}$

Answer: C

218) $3x^2 - y^2 = 4$

A) $y = \frac{x\sqrt{3}}{2}$ or $y = -\frac{x\sqrt{3}}{2}$

B) $y = \sqrt{3}x - \sqrt{4}$ or $y = -\sqrt{3}x + \sqrt{4}$

C) $y = \sqrt{3x^2 - 4}$ or $y = \sqrt{3x^2 + 4}$

D) $y = \sqrt{3x^2 - 4}$ or $y = -\sqrt{3x^2 - 4}$

Answer: D

Find the (x,y) pair for the value of the parameter.

219) $x = 6t$ and $y = t^2 - 9$ for $t = 3$

A) (9, 3) B) (18, 9) C) (0, 9) D) (18, 0)

Answer: D

220) $x = -6t - 8$ and $y = 14 - t$ for $t = -1$

A) (-2, 15) B) (6, 14) C) (15, -2) D) (6, 1)

Answer: A

221) $x = 3t - 8$ and $y = 19 - 7t$ for $t = 2$

A) (6, 19) B) (5, -2) C) (6, -14) D) (-2, 5)

Answer: D

222) $x = t^3 - 6t$ and $y = \sqrt{t - 1}$ for $t = 10$

A) (9, 1060) B) (3, 940) C) (940, 3) D) (1060, 3)

Answer: C

223) $x = |t + 1|$ and $y = \frac{1}{t^2}$ for $t = 2$

A) $\left(3, \frac{1}{4}\right)$ B) $\left(-3, \frac{1}{4}\right)$ C) $\left(\frac{1}{4}, -3\right)$ D) $\left(1, \frac{1}{4}\right)$

Answer: A

Find a direct relationship between x and y.

224) $x = 3t$ and $y = 5t + 5$

A) $y = \frac{x}{3}$ B) $y = \frac{5}{3}x + 5$ C) $y = 15x + 5$ D) $y = 15x$

Answer: B

225) $x = t - 4$ and $y = t^2 + t$

A) $y = x^2 + 9x + 20$ B) $y = x^2 + x + 20$ C) $y = x^2 - 7x + 12$ D) $y = x^2 + x + 12$

Answer: A

226) $x = t - 8$ and $y = t^2 - 5t$

A) $y = x^2 - 21x + 104$ B) $y = x^2 + 11x + 24$ C) $y = x^2 + x + 56$ D) $y = x^2 + 17x + 72$

Answer: B

227) $x = 9t^2$ and $y = t + 2$

A) $x = 9y^2 - 36y + 36$ B) $y = \frac{\sqrt{x}}{3} + 2$ C) $x = 9y^2 + 36y + 36$ D) $y = 3x + 2$

Answer: C

228) $x = 5\sqrt{t}$ and $y = 8t - 4$

A) $y = 200x^2 - 4$ B) $y = \frac{8}{5}x - 4$ C) $y = \frac{8}{25}x^2 - 4$ D) $y = 8\sqrt{5}x - 4$

Answer: C

Find the inverse of the function.

229) $f(x) = 2x - 8$

A) $f^{-1}(x) = \frac{x}{2} + 8$

B) $f^{-1}(x) = \frac{x - 8}{2}$

C) Not a one-to-one function

D) $f^{-1}(x) = \frac{x + 8}{2}$

Answer: D

230) $f(x) = x^3 - 4$

A) $f^{-1}(x) = \sqrt[3]{x} + 4$

B) $f^{-1}(x) = \sqrt[3]{x + 4}$

C) $f^{-1}(x) = \sqrt[3]{x - 4}$

D) Not a one-to-one function

Answer: B

231) $f(x) = 8x^3 - 7$

A) Not a one-to-one function

B) $f^{-1}(x) = \sqrt[3]{\frac{x}{8}} + 7$

C) $f^{-1}(x) = \sqrt[3]{\frac{x - 7}{8}}$

D) $f^{-1}(x) = \sqrt[3]{\frac{x + 7}{8}}$

Answer: D

232) $f(x) = \sqrt{x + 4}$

A) $f^{-1}(x) = \sqrt{x - 4}$

B) $f^{-1}(x) = (x + 4)^2$

C) Not a one-to-one function

D) $f^{-1}(x) = x^2 - 4, x \geq 0$

Answer: D

233) $f(x) = \frac{8x + 1}{-5x - 4}$

A) $f^{-1}(x) = \frac{-5x - 8}{4x + 1}$

B) $f^1(x) = \frac{4x + 1}{-5x - 8}$

C) Not a one-to-one function

D) $f^{-1}(x) = \frac{8x + 1}{-5x - 4}$

Answer: B

234) $f(x) = \frac{8}{x + 2}$

A) $f^{-1}(x) = \frac{x}{2 + 8x}$

B) $f^{-1}(x) = \frac{2 + 8x}{x}$

C) $f^{-1}(x) = \frac{-2x + 8}{x}$

D) Not invertible

Answer: C

235) $f(x) = \sqrt{2x + 1}$

A) $f^{-1}(x) = \frac{(x - 1)^2}{2}$ for $x \geq 0$

B) $f^{-1}(x) = \frac{x^2}{2} - 1$ for $x \geq 0$

C) $f^{-1}(x) = \frac{2x - 1}{2}$

D) $f^{-1}(x) = \frac{x^2 - 1}{2}$ for $x \geq 0$

Answer: D

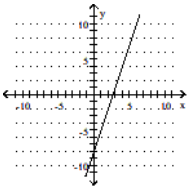
236) $f(x) = \sqrt[3]{\frac{x}{9}} - 8$

A) $f^{-1}(x) = 27(x + 8)$ B) $f^{-1}(x) = 9(x + 8)^3$ C) $f^{-1}(x) = 9(x^3 + 8)$ D) $f^{-1}(x) = [9(x + 8)]^3$

Answer: B

Determine if the function is one-to-one.

237)

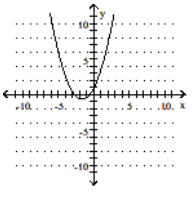


A) No

B) Yes

Answer: B

238)

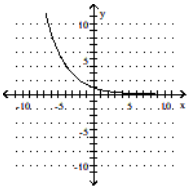


A) Yes

B) No

Answer: B

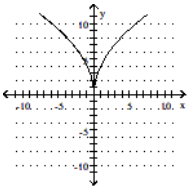
239)



A) Yes B) No

Answer: A

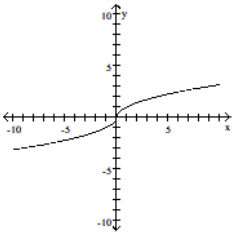
240)



A) Yes B) No

Answer: B

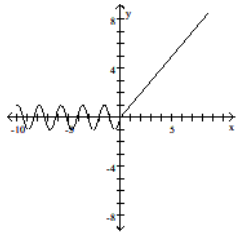
241)



A) No B) Yes

Answer: B

242)



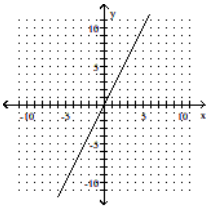
A) No

B) Yes

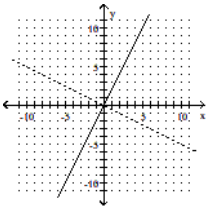
Answer: A

Graph the inverse of the function plotted, on the same set of axes. Use a dashed curve for the inverse.

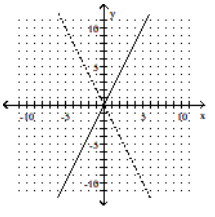
243)



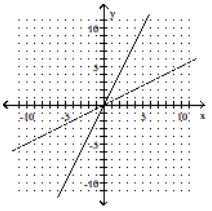
A)



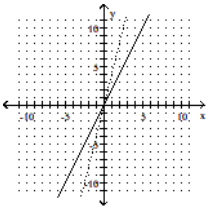
B)



C)

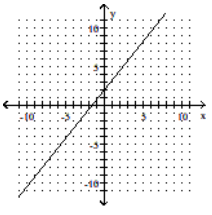


D)

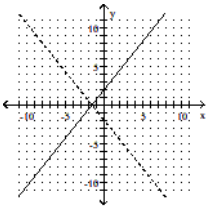


Answer: C

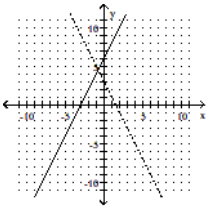
244)



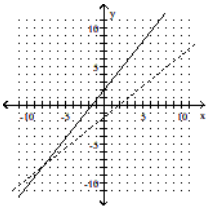
A)



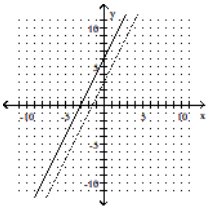
B)



C)

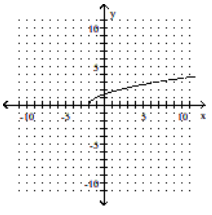


D)

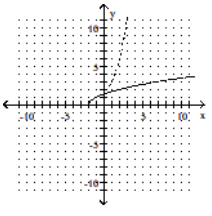


Answer: C

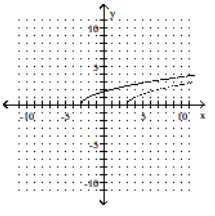
245)



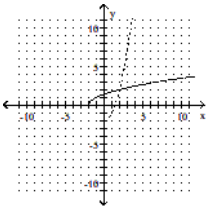
A)



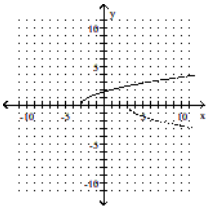
B)



C)

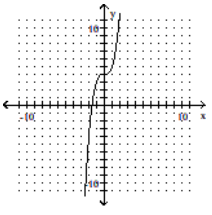


D)

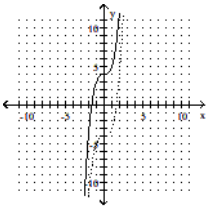


Answer: C

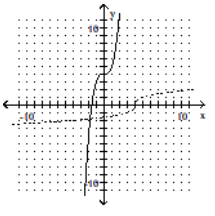
246)



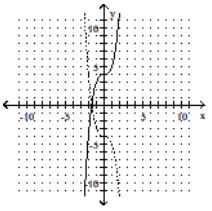
A)



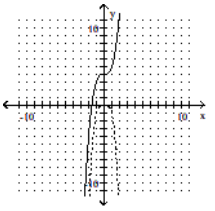
B)



C)

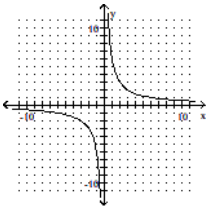


D)

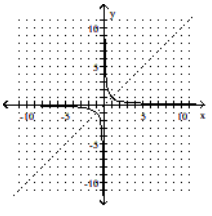


Answer: B

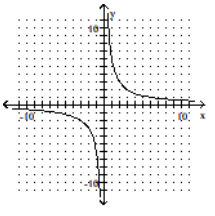
247)



A)

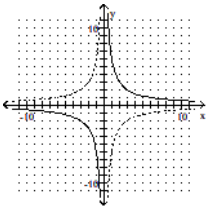


B)

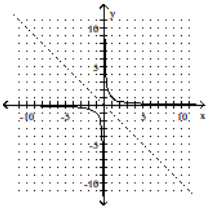


Function is its own inverse.

C)



D)



Answer: B

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Confirm that f and g are inverses by showing that f(g(x)) = x and g(f(x)) = x.

248) $f(x) = 7x + 4$ and $g(x) = \frac{x - 4}{7}$

Answer: $f(g(x)) = 7\left(\frac{x - 4}{7}\right) + 4 = x - 4 + 4 = x$

$g(f(x)) = \frac{7x + 4 - 4}{7} = \frac{7x}{7} = x$

249) $f(x) = \frac{x + 2}{5}$ and $g(x) = 5x - 2$

Answer: $f(g(x)) = \frac{5x - 2 + 2}{5} = \frac{5x}{5} = x$

$g(f(x)) = 5\left(\frac{x + 2}{5}\right) - 2 = x + 2 - 2 = x$

250) $f(x) = x^3 + 9$ and $g(x) = \sqrt[3]{x - 9}$

Answer: $f(g(x)) = (\sqrt[3]{x - 9})^3 + 9 = x - 9 + 9 = x$

$g(f(x)) = \sqrt[3]{(x^3 + 9) - 9} = \sqrt[3]{x^3} = x$

251) $f(x) = x^2 - 7$ and $g(x) = \sqrt{7 + x}$

Answer: $f(g(x)) = (\sqrt{7 + x})^2 - 7 = 7 + x - 7 = x$

$g(f(x)) = \sqrt{7 + x^2 - 7} = \sqrt{x^2} = x$

252) $f(x) = \frac{2}{x}$ and $g(x) = \frac{2}{x}$

Answer: $f(g(x)) = \frac{2}{\frac{2}{x}} = 2 \cdot \frac{x}{2} = x$

$g(f(x)) = \frac{2}{\frac{2}{x}} = 2 \cdot \frac{x}{2} = x$

253) $f(x) = \frac{x + 7}{x}$ and $g(x) = \frac{7}{x - 1}$

Answer: $f(g(x)) = \frac{\frac{7}{x - 1} + 7}{\frac{7}{x - 1}} = \frac{\frac{7 + 7(x - 1)}{x - 1}}{\frac{7}{x - 1}} = \frac{\frac{7x}{x - 1}}{\frac{7}{x - 1}} = x$

$g(f(x)) = \frac{7}{\frac{x + 7}{x} - 1} = \frac{7}{\frac{x + 7 - x}{x}} = \frac{7}{\frac{7}{x}} = x$

254) $f(x) = \frac{x + 8}{x - 7}$ and $g(x) = \frac{7x + 8}{x - 1}$

Answer: $f(g(x)) = \frac{\frac{7x + 8}{x - 1} + 8}{\frac{7x + 8}{x - 1} - 7} = \frac{\frac{7x + 8 + 8(x - 1)}{x - 1}}{\frac{7x + 8 - 7(x - 1)}{x - 1}} = \frac{\frac{15x}{x - 1}}{\frac{15}{x - 1}} = x$

$g(f(x)) = \frac{7\left(\frac{x + 8}{x - 7}\right) + 8}{\frac{x + 8}{x - 7} - 1} = \frac{\frac{7(x + 8) + 8(x - 7)}{x - 7}}{\frac{x + 8 - (x - 7)}{x - 7}} = \frac{\frac{15x}{x - 1}}{\frac{15}{x - 1}} = x$

255) $f(x) = \frac{x - 2}{x + 9}$ and $g(x) = \frac{-9x - 2}{x - 1}$

Answer: $f(g(x)) = \frac{\frac{-9x - 2}{x - 1} - 2}{\frac{-9x - 2}{x - 1} + 9} = \frac{\frac{-9x - 2 - 2(x - 1)}{x - 1}}{\frac{-9x - 2 + 9(x - 1)}{x - 1}} = \frac{\frac{-11x}{x - 1}}{\frac{-11}{x - 1}} = x$

$g(f(x)) = \frac{-9\left(\frac{x - 2}{x + 9}\right) - 2}{\frac{x - 2}{x + 9} - 1} = \frac{\frac{-9x + 18 - 2(x + 9)}{x + 9}}{\frac{x - 2 - (x + 9)}{x + 9}} = \frac{\frac{-11x}{x - 1}}{\frac{-11}{x + 9}} = x$

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the problem.

256) Let f(x) compute the time in hours to travel x miles at 32 miles per hour. What does $f^{-1}(x)$ compute?

A) The miles traveled in 32 hours
B) The hours taken to travel 32 miles
C) The miles traveled in x hours
D) The hours taken to travel x miles

Answer: C

257) Let f(x) compute the time in hours to travel x miles at 36 miles per hour. What is the interpretation the solution of $f^{-1}(x) = 8$?

A) The hours taken to travel 8 miles
B) The miles traveled in 8 hours
C) The hours taken to travel 36 miles
D) The miles traveled in 36 hours

Answer: B

258) Let f(x) compute the cost of a rental car after x days of use at $28 per day. What does $f^{-1}(x)$ compute?

A) The number of days rented for 28 dollars
B) The cost of rental for 28 days
C) The number of days rented for x dollars
D) The cost of rental for x days

Answer: C

259) Let f(x) compute the cost of a rental car after x days of use at $26 per day. What is the interpretation of the solutio of $f^{-1}(x) = 175$?

A) The number of days rented for $26
B) The number of days rented for $175
C) The cost of rental for 26 days
D) The cost of rental for 175 days

Answer: B

Describe how the graph of $y=x^2$ can be transformed to the graph of the given equation.

260) $y = x^2 - 13$

A) Shift the graph of $y = x^2$ down 13 units.
B) Shift the graph of $y = x^2$ right 13 units.
C) Shift the graph of $y = x^2$ left 13 units.
D) Shift the graph of $y = x^2$ up 13 units.

Answer: A

261) $y = x^2 + 3$

A) Shift the graph of $y = x^2$ right 3 units.
B) Shift the graph of $y = x^2$ up 3 units.
C) Shift the graph of $y = x^2$ down 3 units.
D) Shift the graph of $y = x^2$ left 3 units.

Answer: B

262) $y = (x + 17)^2$

A) Shift the graph of $y = x^2$ down 17 units.
B) Shift the graph of $y = x^2$ up 17 units.
C) Shift the graph of $y = x^2$ right 17 units.
D) Shift the graph of $y = x^2$ left 17 units.

Answer: D

263) $y = (x - 18)^2$

A) Shift the graph of $y=x^2$ down 18 units.
B) Shift the graph of $y = x^2$ left 18 units.
C) Shift the graph of $y = x^2$ right 18 units.
D) Shift the graph of $y = x^2$ up 18 units.

Answer: C

264) $y = (x - 20)^2 + 11$

A) Shift the graph of $y = x^2$ left 20 units and then down 11 units.

B) Shift the graph of $y = x^2$ up 20 units and then right 11 units.

C) Shift the graph of $y = x^2$ right 20 units and then up 11 units.

D) Shift the graph of $y = x^2$ left 20 units and then up 11 units.

Answer: C

265) $y = (x + 9)^2 - 15$

A) Shift the graph of $y = x^2$ down 9 units and then left 15 units.

B) Shift the graph of $y = x^2$ right 9 units and then down 15 units.

C) Shift the graph of $y = x^2$ up 9 units and then right 15 units.

D) Shift the graph of $y = x^2$ left 9 units and then down 15 units.

Answer: D

266) $y = (x - 20)^2 - 11$

A) Shift the graph of $y = x^2$ right 20 units and then up 11 units.

B) Shift the graph of $y = x^2$ down 20 units and then left 11 units.

C) Shift the graph of $y = x^2$ left 20 units and then down 11 units.

D) Shift the graph of $y = x^2$ right 20 units and then down 11 units.

Answer: D

267) $y = (x + 16)^2 + 17$

A) Shift the graph of $y = x^2$ down 16 units and then right 17 units.

B) Shift the graph of $y = x^2$ right 16 units and then up 17 units.

C) Shift the graph of $y = x^2$ up 16 units and then left 17 units.

D) Shift the graph of $y = x^2$ left 16 units and then up 17 units.

Answer: D

Describe how to transform the graph of f into the graph of g.

268) $f(x) = \sqrt{x}$ and $g(x) = 6\sqrt{x}$

A) Horizontally stretch the graph of f by a factor of 6.

B) Vertically stretch the graph of f by a factor of 6.

C) Vertically shrink the graph of f by a factor of $\frac{1}{6}$.

D) Horizontally shrink the graph of f by a factor of $\frac{1}{6}$.

Answer: B

269) $f(x) = \sqrt{x}$ and $g(x) = \sqrt{0.1x}$

A) Horizontally stretch the graph of f by a factor of 10.

B) Vertically stretch the graph of f by a factor of 10.

C) Horizontally shrink the graph of f by a factor of 10.

D) Vertically shrink the graph of f by a factor of 10.

Answer: A

270) $f(x) = \sqrt{x}$ and $g(x) = -\sqrt{x+4}$

A) Shift the graph of f right 4 units and then reflect across the x-axis.
B) Shift the graph of f left 4 units and then reflect across the x-axis.
C) Shift the graph of f left 4 units and then reflect across the y-axis.
D) Shift the graph of f up 4 units and then reflect across the y-axis.

Answer: B

271) $f(x) = \sqrt{x}$ and $g(x) = \frac{1}{5}\sqrt{x}$

A) Horizontally stretch the graph of f by a factor of $\frac{1}{5}$.

B) Horizontally shrink the graph of f by a factor of $\frac{1}{5}$.

C) Vertically stretch the graph of f by a factor of $\frac{1}{5}$.

D) Vertically shrink the graph of f by a factor of $\frac{1}{5}$.

Answer: D

272) $f(x) = x^3$ and $g(x) = -x^3$

A) Reflect the graph of f across the x-axis.
B) Shift the graph of f down 1 unit.
C) Reflect the graph of f across the y-axis.
D) Reflect the graph of f across the x-axis and then reflect across the y-axis.

Answer: A

273) $f(x) = \sqrt{x}$ and $g(x) = -\sqrt{-x}$

A) The two graphs are the same.
B) Reflect the graph of f across the y-axis.
C) Reflect the graph of f across the x-axis.
D) Reflect the graph of f across the y-axis and then reflect across the x-axis.

Answer: D

274) $f(x) = x^5$ and $g(x) = (5x)^5$

A) Horizontally shrink the graph of f by a factor of $\frac{1}{5}$.

B) Vertically shrink the graph of f by a factor of $\frac{1}{5}$.

C) Vertically stretch the graph of f by a factor of 5.
D) Horizontally stretch the graph of f by a factor of 5.

Answer: A

275) $f(x) = \sqrt{x-3}$ and $g(x) = \sqrt{x+6}$

A) Shift the graph of f left 9 units.
B) Shift the graph of f right 3 units.
C) Shift the graph of f left 3 units.
D) Shift the graph of f right 9 units.

Answer: A

276) $f(x) = (x + 7)^2$ and $g(x) = -(x - 1)^2$

A) Shift the graph of f left 8 units and reflect across the x-axis.

B) Shift the graph of f down 8 units and reflect across the y-axis.

C) Shift the graph of f right 8 units and reflect across the x-axis

D) Shift the graph of f right 8 units.

Answer: C

277) $f(x) = |4x|$ and $g(x) = 2|x|$

A) Vertically stretch the graph of f by a factor of 4 and horizontally shrink by a factor of $\frac{1}{2}$.

B) Horizontally stretch the graph of f by a factor of 4 and vertically stretch by a factor of 2.

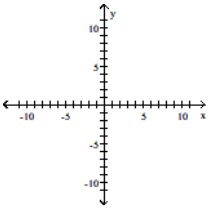
C) Horizontally shrink the graph of f by a factor of $\frac{1}{4}$ and vertically stretch by a factor of 2.

D) Vertically stretch the graph by a factor of 4 + 2.

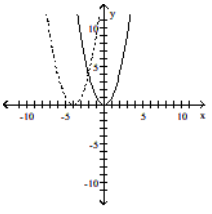
Answer: B

Sketch the graph of y_1 as a solid line or curve. Then sketch the graph of y_2 as a dashed line or curve by one or more of these: a vertical and/or horizontal shift of the graph y_1, a vertical stretch or shrink of the graph of y_1, or a reflection of the graph of y_1 across an axis.

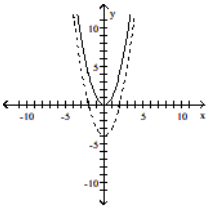
278) $y_1 = x^2$; $y_2 = x^2 - 4$



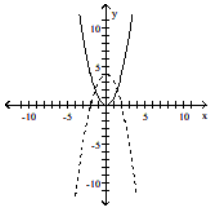
A)



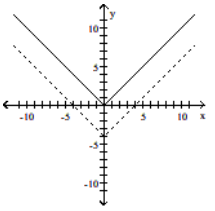
B)



C)

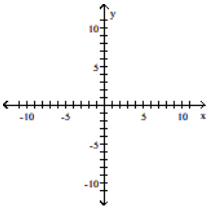


D)

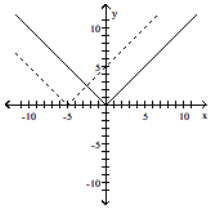


Answer: B

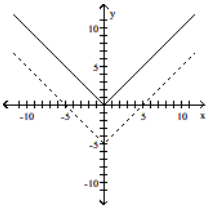
279) $y_1 = |x|$; $y_2 = |x - 5|$



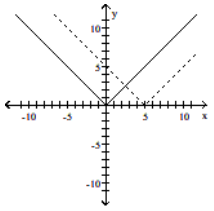
A)



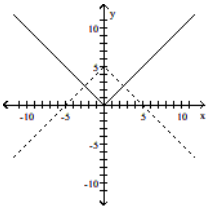
B)



C)

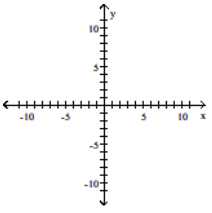


D)

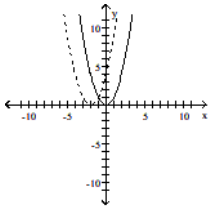


Answer: C

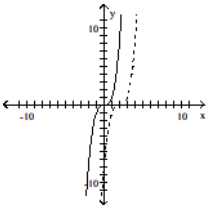
280) $y_1 = x^3$; $y_2 = (x + 2)^3$



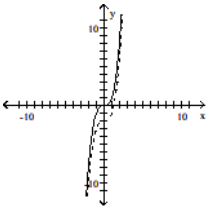
A)



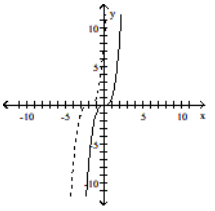
B)



C)

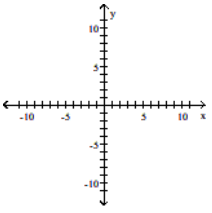


D)

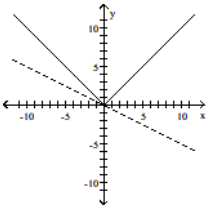


Answer: D

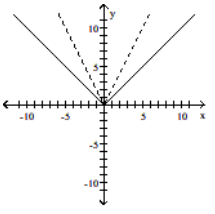
281) $y_1 = |x|$; $y_2 = -2|x|$



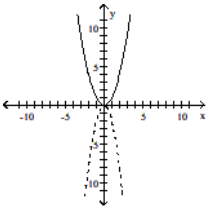
A)



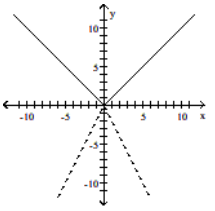
B)



C)

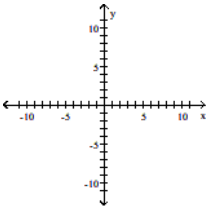


D)

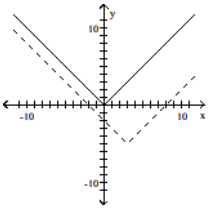


Answer: D

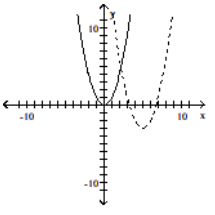
282) $y_1 = x^2$; $y_2 = (x - 3)^2 - 5$



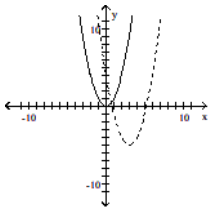
A)



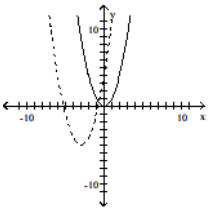
B)



C)

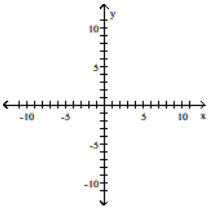


D)

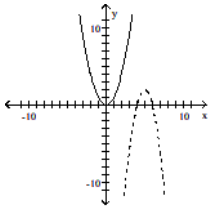


Answer: C

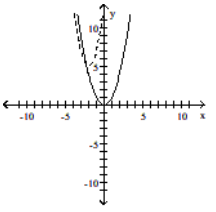
283) $y_1 = x^2$, $y_2 = -2(x + 5)^2 + 2$



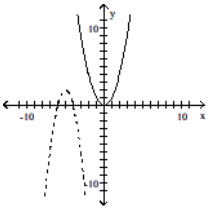
A)



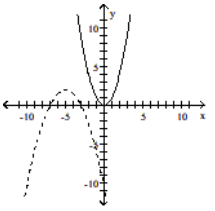
B)



C)

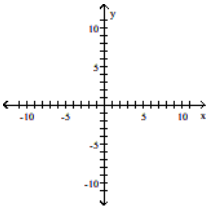


D)

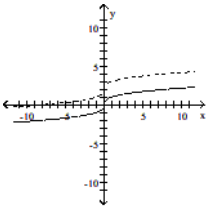


Answer: C

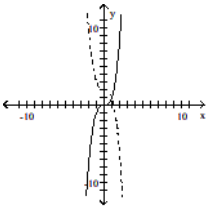
284) $y_1 = \sqrt[3]{x}$, $y_2 = \sqrt[3]{x} + 2$



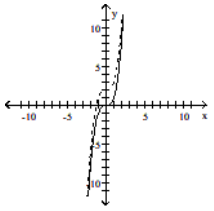
A)



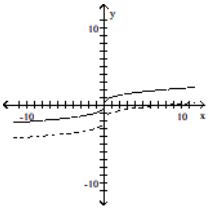
B)



C)

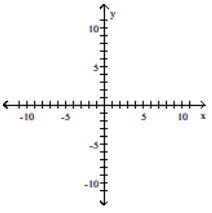


D)

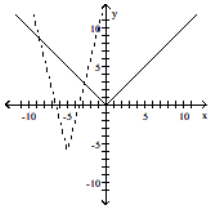


Answer: A

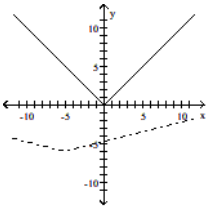
285) $y_1 = |x|$, $y_2 = \frac{1}{4}|x + 5| - 6$



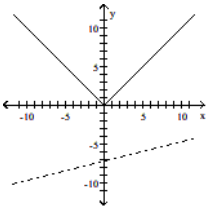
A)



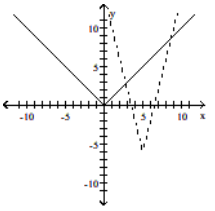
B)



C)

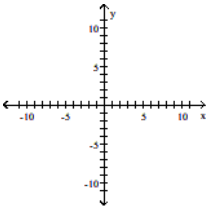


D)

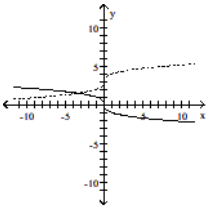


Answer: B

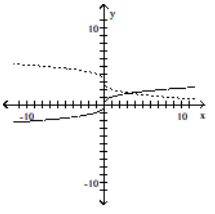
286) $y_1 = \sqrt[3]{x}, y_2 = \sqrt[3]{-x} + 3$



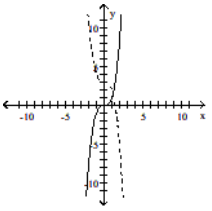
A)



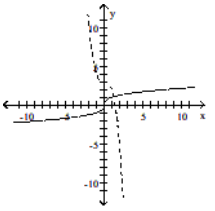
B)



C)



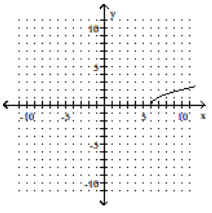
D)



Answer: B

The graph is that of a function y = f(x) that can be obtained by transforming the graph of $y = \sqrt{x}$. Write a formula for the function f.

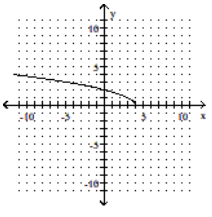
287)



A) $f(x) = \sqrt{x - 6}$ B) $f(x) = \sqrt{x + 6}$ C) $f(x) = \sqrt{x} + 6$ D) $f(x) = \sqrt{x} - 6$

Answer: A

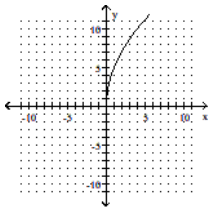
288)



A) $f(x) = \sqrt{-x + 4}$ B) $f(x) = \sqrt{-x} + 4$ C) $f(x) = -\sqrt{x} + 4$ D) $f(x) = -\sqrt{x + 4}$

Answer: A

289)



A) $f(x) = 5\sqrt{x}$ B) $f(x) = \sqrt{\frac{x}{5}}$ C) $f(x) = \sqrt{5x}$ D) $f(x) = \frac{\sqrt{x}}{5}$

Answer: A

Give the equation of the function g whose graph is described.

290) The graph of $f(x) = |x|$ is vertically stretched by a factor of 4.8. This graph is then reflected across the x-axis. Finally, the graph is shifted 0.52 units downward.

A) $g(x) = 4.8|-x| - 0.52$ B) $g(x) = 4.8|x| - 0.52$ C) $g(x) = -4.8|x| - 0.52$ D) $g(x) = 4.8|x - 0.52|$

Answer: C

291) The graph of $f(x) = \sqrt[3]{x}$ is shifted 4.2 units to the left. This graph is then vertically stretched by a factor of 3.3. Finally, the graph is reflected across the x-axis.

A) $g(x) = -3.3\sqrt[3]{x + 4.2}$ B) $g(x) = -4.2\sqrt[3]{x + 3.3}$

C) $g(x) = 3.3\sqrt[3]{x + 4.2}$ D) $g(x) = -3.3\sqrt[3]{x - 4.2}$

Answer: A

292) The graph of $f(x) = x^2 - 4x + 3$ is horizontally shrunk by a factor of 1/4 .

A) $g(x) = 4x^2 - 16x + 12$ B) $g(x) = \frac{1}{4}x^2 - x + \frac{3}{4}$

C) $g(x) = 4x^2 - 16x + 3$ D) $g(x) = \frac{1}{16}x^2 - x + 3$

Answer: A

293) The graph of $f(x) = |x^2 + 6x|$ is horizontally stretched by a factor of 3.

A) $g(x) = 3|x^2 + 6x|$ B) $g(x) = \left|\frac{1}{3}x^2 + 2x\right|$ C) $g(x) = |9x^2 + 18x|$ D) $g(x) = \left|\frac{1}{9}x^2 + 2x\right|$

Answer: D

294) The graph of $f(x) = x^3 - 3x^2 + 2x + 1$ is reflected across the y-axis .

A) $g(x) = -x^3 - 3x^2 - 2x + 1$ B) $g(x) = -x^3 - 3x^2 - 2x - 1$

C) $g(x) = -x^3 + 3x^2 - 2x - 1$ D) $g(x) = x^3 + 3x^2 + 2x + 1$

Answer: A

295) The graph of $f(x) = 6\sqrt{x - 1} + 5$ is reflected across the x-axis .

A) $g(x) = -6\sqrt{x - 1} + 5$ B) $g(x) = 6\sqrt{-x - 1} + 5$

C) $g(x) = 6\sqrt{-x - 1} - 5$ D) $g(x) = -6\sqrt{x - 1} - 5$

Answer: D

296) The graph of $f(x) = x^2$ is vertically stretched by a factor of 8, and the resulting graph is reflected across the x-axis.

A) $g(x) = -8x^2$ B) $g(x) = (x - 8)^2$ C) $g(x) = 8(x - 8)x^2$ D) $g(x) = 8x^2$

Answer: A

297) The graph of $f(x) = x^3$ is shifted 1.3 units to the right and then vertically shrunk by a factor of 0.9.

A) $g(x) = 1.3(x - 0.9)^3$ B) $g(x) = 0.9(x + 1.3)^3$ C) $g(x) = 0.9(x - 1.3)^3$ D) $g(x) = 0.9x^3 + 1.3$

Answer: C

298) The graph of $f(x) = \sqrt{x}$ is shifted 9 units to the left. Then the graph is shifted 2 units upward.

A) $g(x) = \sqrt{x - 9} + 2$ B) $g(x) = 2\sqrt{x + 9}$ C) $g(x) = \sqrt{x + 9} + 2$ D) $g(x) = \sqrt{x + 2} + 9$

Answer: C

299) The graph of $f(x) = |x|$ is reflected across the y-axis. This graph is then vertically stretched by a factor of 7.9. Finally, the graph is shifted 8 units downward.

A) $g(x) = 7.9|-x| - 8$ B) $g(x) = 8|-x| - 7.9$ C) $g(x) = 7.9|-x| + 8$ D) $g(x) = -7.9|x| - 8$

Answer: A

Fill in the blanks to complete the statement.

300) The graph of $y = -\sqrt{x + 7}$ can be obtained from the graph of $y = \sqrt{x}$ by shifting horizontally ? units to the ? and reflecting across the ? -axis.

A) 7; right; x B) 7; left; x C) 7; left; y D) -7; left; x

Answer: B

301) The graph of $y = (x - 8)^2 - 5$ can be obtained from the graph of $y = x^2$ by shifting horizontally ? units to the ? and shifting vertically ? units to the ? direction.

A) 8; left; 5; upward B) 8; left; 5; downward

C) 8; right; 5; downward D) 5; right; 8; downward

Answer: C

302) The graph of $y = -5x^3 + 2$ can be obtained from the graph of $y = x^3$ by vertically stretching by a factor of ?; reflecting across the ? -axis, and shifting vertically ? units in the ? direction.

A) 5; x; 2; upward B) 2; x; 5; upward

C) 5; y; 2; upward D) -5; x; 2; downward

Answer: A

303) The graph of $y = 0.1|x - 9| + 8.5$ can be obtained by shifting horizontally ? units to the ?, vertically shrinking by a factor of ?, and then shifting vertically ? units in the ? direction.

A) 9; left; 0.1; 8.5; upward B) 0.1; left; 9; 8.5; upward

C) 8.5; right; 0.1; 9; downward D) 9; right; 0.1; 8.5; upward

Answer: D

304) The graph of $y = -0.2\sqrt[3]{-x}$ can be obtained from the graph of $y = \sqrt[3]{x}$ by reflecting across the ? -axis, shrinking vertically by a factor of ?, and then reflecting across the ? -axis.

A) x; 0.2; x B) y; 0.2; x C) y; -0.2; x D) x; -0.2; y

Answer: B

305) The graph of $y = 0.8|-x| - 10$ can be obtained from the graph of $y = |x|$ by reflecting across the ? -axis, shrinking vertically by a factor of ?, and then shifting vertically ? units in the ? direction.

A) y; -0.8; 10; downward B) x; 10; 0.8; upward

C) x; 0.8; 10; downward D) y; 0.8; 10; downward

Answer: D

306) The graph of $y = -\frac{1}{7}\sqrt[3]{x + 9}$ can be obtained from the graph of $y = \sqrt[3]{x}$ by shifting horizontally ? units to the ?, vertically shrinking by a factor of ?, and then reflecting across the ? -axis.

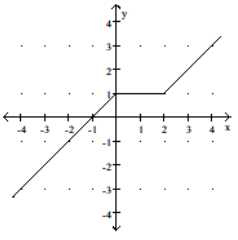
A) 9; right; 1/7; x B) 9; right; -1/7; y C) 1/7; right; 9; y D) 9; left; 1/7; x

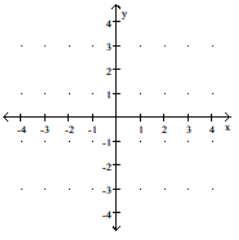
Answer: D

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

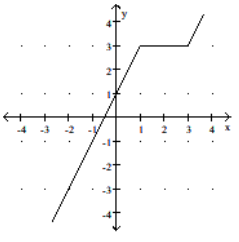
Sketch the graph of the given function based on the graph of the function f given below.

307) Sketch the graph of $y = 1 + 2f(x - 1)$.

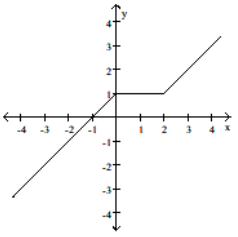


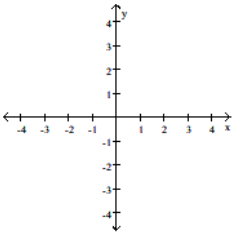


Answer:

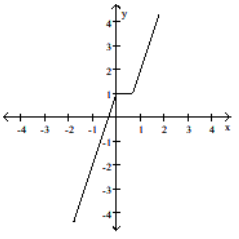


308) Sketch the graph of y = f(3x).

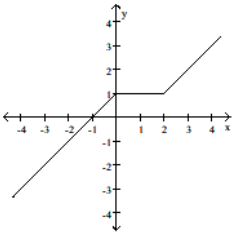


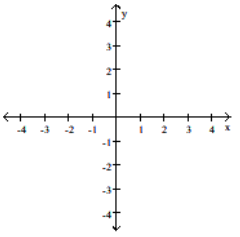


Answer:

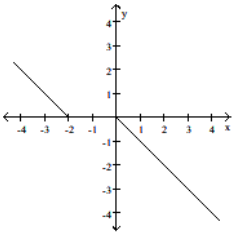


309) Sketch the graph of y = - f(x + 2) - 1.

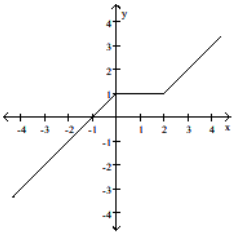


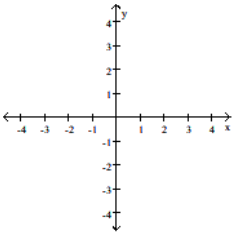


Answer:

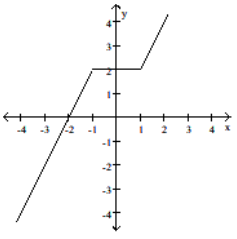


310) Sketch the graph of y = 2f(x + 1).

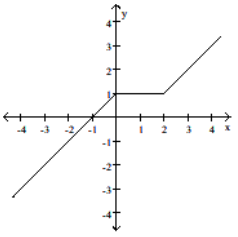


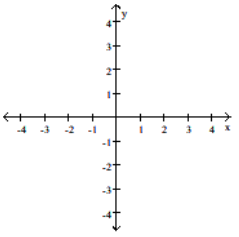


Answer:

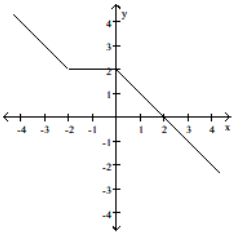


311) Sketch the graph of y = 1 + f(-x).

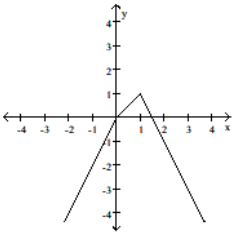


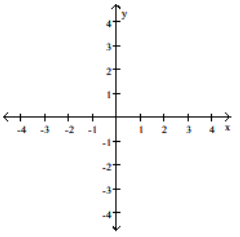


Answer:

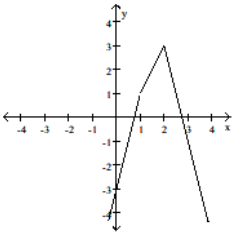


312) Sketch the graph of y = 1 + 2f(x - 1).

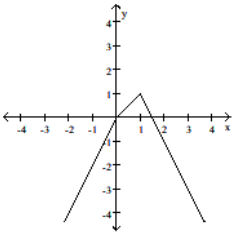


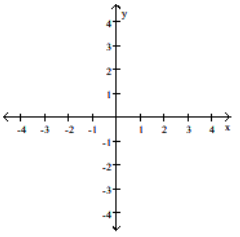


Answer:

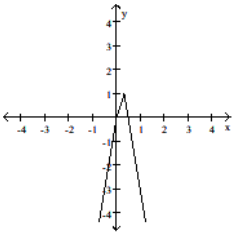


313) Sketch the graph of y = f(3x).

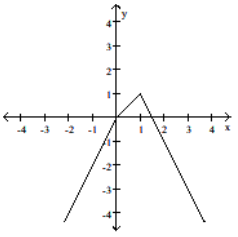


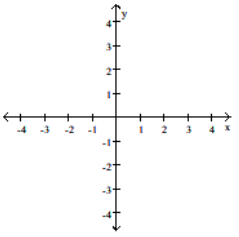


Answer:

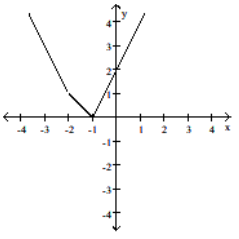


314) Sketch the graph of $y = -f(x + 2) - 1$.

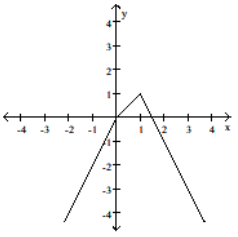


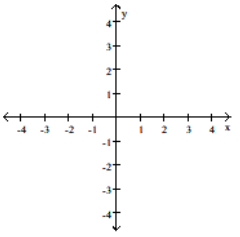


Answer:

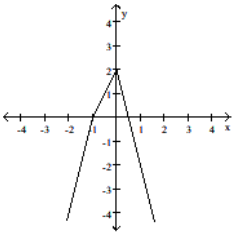


315) Sketch the graph of y = 2f(x + 1).

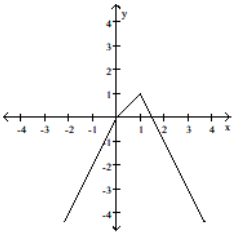


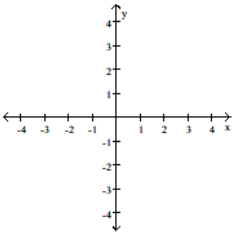


Answer:

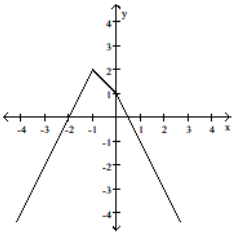


316) Sketch the graph of y = 1 + f(-x).





Answer:



MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Write a mathematical expression for the quantity described verbally.

317) Eight less than four times a number x

A) 8x - 4 B) 8 - 4x C) 8x + 4 D) 4x - 8

Answer: D

318) A number x decreased by six and then doubled

A) 2x - 6 B) x - 26 C) 2(x + 6) D) 2(x - 6)

Answer: D

319) Two more than 5% of a number x

A) 5x + 2 B) 0.05 + 2x C) 0.5x + 2 D) 0.05x + 2

Answer: D

320) The area of a rectangle whose length is 15 more than its width x

A) (x + 15)(x) B) 2x + 15 C) (x)(x - 15) D) $2(x^2 + 15x)$

Answer: A

321) The area of a triangle whose altitude is 8 more than its base length x

A) $\frac{1}{2}(x)(x - 8)$ B) $(x)(x + 8)$ C) $\frac{1}{2}(x)(x + 8)$ D) $\frac{1}{2}x^2 - 8$

Answer: C

322) A salary after a 5.1% increase, if the original salary is x dollars

A) 0.051x B) 6.1x C) 1.051x D) 5.1x

Answer: C

323) Sale price of an item marked x dollars, if 70% is discounted from the marked price

A) 0.3x B) x - 70 C) 1.7x D) x - 0.7

Answer: A

324) The total cost if $20,000 plus $6.35 for each item produced.

A) $(20,000 + 6.35x) B) $(20,000 - 6.35x) C) $(20,000 + 6.35)x D) $(20,000x + 6.35)

Answer: A

325) The revenue when each item sells for $31,416.

A) 31,416 - x B) 31,416 + x C) 31,416x D) x - 31,416

Answer: C

326) The profit consists of a franchise fee of $100,000 plus 20% of all sales

A) 0.2 + 100,000x B) 20x + 100,000 C) (0.2x + 100,000) D) $100,000 - 0.2

Answer: C

Write the specified quantity as a function of the specified variable.

327) One leg of a right triangle is three times as long as the other. Write the length of the hypotenuse as a function of the length of the shorter leg.

A) c = 2a B) $c = 10a^2$ C) $c = 2\sqrt{a}$ D) $c = a\sqrt{10}$

Answer: D

328) The base of an isosceles triangle is a third as long as the two equal sides. Write the perimeter of the triangle as a function of the length of the base.

A) $P = \frac{8}{3}b$ B) $P = <\frac{5}{3}b$ C) P = 7b D) P = 5b

Answer: C

329) A circle is inscribed in a square. Write the area of the square as a function of the radius.

A) $A = 2r^2$ B) A = 2r C) $A = r^3$ D) $A = 4r^2$

Answer: D

330) A square is inscribed in a circle. Write the area of the square as a function of the radius.

A) $A = r^3$ B) A = 2r C) $A = 2r^2$ D) $A = 4r^2$

Answer: C

331) The base of an isosceles triangle is a fourth as long as the two equal sides. Write the area of the triangle as a function of the length of the base.

A) $A = \frac{\sqrt{15}}{4}b^2$ B) $A = \frac{63}{8}b^3$ C) $A = 2b^2$ D) $A = \frac{3\sqrt{7}}{4}b^2$

Answer: D

332) The base of an isosceles triangle is half as long as the two equal sides. Write the area of the triangle as a function of the length of the base.

A) $A = 7b$ B) $A = \frac{15}{16}b^3$ C) $A = \frac{\sqrt{15}}{4}b^2$ D) $A = \frac{15}{16}b^2$

Answer: C

333) The height of a right circular cylinder equals its diameter. Write the volume of the cylinder as a function of its radius.

A) $V = \pi r^3$ B) $V = 4\pi r$ C) $V = 2\pi r^3$ D) $V = \frac{1}{2}\pi r^3$

Answer: C

Use an equation to solve the problem.

334) One positive number is twice another positive number. The sum of the two numbers is 360. Find the two numbers.

A) 180, 180 B) 120, 122 C) 120, 240 D) 60, 300

Answer: C

335) When a number is added to its double and its triple, the sum is 138. Find the three numbers.

A) 23, 46, 138 B) 46, 69, 92 C) 46, 69, 138 D) 23, 46, 69

Answer: D

336) When a number, half of the number, and a third of the number are added together, the sum is 275. Find the three numbers.

A) 150, 75, 50

Answer: A

337) Joe Pearlman received a 2.75% pay decrease. His salary after the decrease was $36,955. What was his salary before the decrease?

A) $37,997.25 B) $37,999.725 C) $38,000 D) $39,045

Answer: C

338) If Gloria received a 4% raise and is now making $24,960 a year, what was her salary before the raise?

A) $24,000 B) $22,960 C) $23,960 D) $25,000

Answer: A

339) On Monday, an investor bought 100 shares of stock. On Tuesday, the value of the shares went up 5%. How much did the investor pay for the 100 shares if he sold them Wednesday morning for $1470.00?

A) $1543.50 B) $1420.00 C) $1450.00 D) $1400.00

Answer: D

340) A construction company builds a swimming pool with a perimeter of 50 m. The length is 3 m more than the width. Find the dimensions of the swimming pool?

A) 19 m × 11 m B) 9 m × 11 m C) 14 m × 3 m D) 14 m × 11 m

Answer: D

341) Between 1990 and 2000 the population of a certain city grew from 202,000 to 239,700. What was the percentage increase in the population of the city?

A) 18.7% B) 19.6% C) 15.7% D) 1.9%

Answer: A

342) A square of side x inches is cut out of each corner of an 8 in. by 12 in. piece of cardboard, and the sides are folded up to form an open-topped box. Use your graphing calculator to determine the dimensions of the cut-out squares that will produce the box of maximum volume.
(Hint: you will first need to write the volume of the box V as a function of x.)

A) 1.7 inches by 1.7 inches B) 1.8 inches by 1.8 inches
C) 1.6 inches by 1.6 inches D) 1.4 inches by 1.4 inches

Answer: C

343) A tire of a moving bicycle has radius 16 inches. If the tire is making 3 rotations per second, find the bicycle's speed in miles per hour.

A) 19.7 mph B) 5.7 mph C) 17.1 mph D) 18.6 mph

Answer: C

Solve the problem.

344) Sue invested $10,000, part at 5.9% annual interest and the balance at 6.7% annual interest. How much is invested at each rate if a 1-year interest payment is $645.52?

A) $2960 at 5.9% and $4160 at 6.7% B) $3160 at 5.9% and $6840 at 6.7%
C) $3060 at 5.9% and $6940 at 6.7% D) $6940 at 5.9% and $3060 at 6.7%

Answer: C

345) Helen Weller invested $14,000 in an account that pays 10% simple interest. How much additional money must be invested in an account that pays 13% simple interest so that the average return on the two investments amounts to 11%?

A) $10,000 B) $7000 C) $11,000 D) $14,000

Answer: B

346) Mardi received an inheritance of $60,000. She invested part at 11% and deposited the remainder in tax-free bonds at 12%. Her total annual income from the investments was $6800. Find the amount invested at 11%.

A) $39,000 B) $20,000 C) $40,000 D) $53,200

Answer: C

347) A traveling salesperson averaged 48 miles per hour on a 246 mile trip. How many hours were spent on the trip?

A) 2.56 hours B) 0.2 hours C) 198 hours D) 5.13 hours

Answer: D

348) An airplane leaves Los Angeles for Denver at a speed of 400 mph. Thirty minutes later, a plane going from Denver to Los Angeles leaves Denver, which is 850 miles from Los Angeles, at a speed of 470 mph. When they meet, how far are they from Denver?

A) 351 miles B) 59 miles C) 293 miles D) 117 miles

Answer: A

349) The speed of a freight train is 23 mph slower than that of a passenger train. The freight train travels 350 mi in the same time it takes the passenger train to travel 440 mi. Find the speed of the passenger train.

A) 225 mph B) 5 mph C) 3 mph D) 112 mph

Answer: D

350) On a recent trip, Sarah's car traveled 20 mph faster on the first 200 miles than it did on the remaining 80 miles. The total time for the trip was 4 hr. Find the speed of Sarah's car on the first part of the trip.

A) 68 mph B) 57 mph C) 77 mph D) 13 mph

Answer: C

351) How many liters of a 30% alcohol solution must be mixed with 90 liters of a 80% solution to get a 60% solution?

A) 150 L B) 6 L C) 60 L D) 15 L

Answer: C

352) In a chemistry class, 7 liters of a 4% silver iodide solution must be mixed with a 10% solution to get a 6% solution. How many liters of the 10% solution are needed?

A) 2.5 L B) 4.5 L C) 7.0 L D) 3.5 L

Answer: D

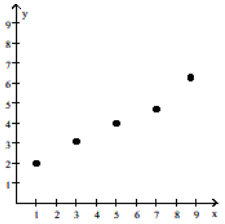
353) Anne and Nancy use a metal alloy that is 18.6% copper to make jewelry. How many ounces of a 12% alloy must be mixed with a 23% alloy to form 75 ounces of the desired alloy?

A) 32 ounces B) 30 ounces C) 45 ounces D) 50 ounces

Answer: B

Tell which of the following types of regression is likely to give the most accurate model for the scatter plot shown: linear regression, quadratic regression, cubic regression, exponential regression, sinusoidal regression.

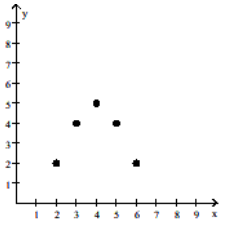
354)



A) Quadratic regression
B) Linear regression
C) Sinusoidal regression
D) Exponential regression
E) Cubic regression

Answer: B

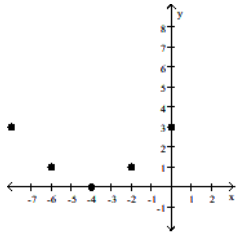
355)



A) Linear regression
B) Cubic regression
C) Sinusoidal regression
D) Exponential regression
E) Quadratic regression

Answer: E

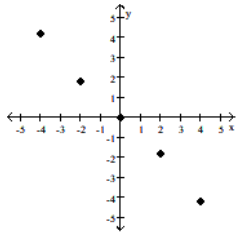
356)



A) Linear regression
B) Quadratic regression
C) Cubic regression
D) Sinusoidal regression
E) Exponential regression

Answer: B

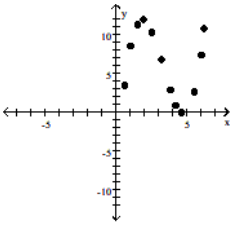
357)



A) Cubic regression
B) Linear regression
C) Exponential regression
D) Sinusoidal regression
E) Quadratic regression

Answer: B

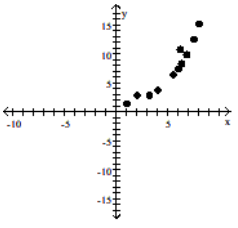
358)



A) Cubic regression
B) Exponential regression
C) Quadratic regression
D) Linear regression
E) Sinusoidal regression

Answer: A

359)



A) Quadratic regression
B) Cubic regression
C) Sinusoidal regression
D) Linear regression
E) Exponential regression

Answer: E

Provide an appropriate response.

360) True or False. The function $y = \frac{x^2 - 1^2}{x - 1}$ is not continuous at x = 1.

A) False B) True

Answer: B

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

361) Graph the function $y = \frac{1}{x - 2}$ in connected mode in the standard viewing window of your calculator. Does your calculator draw a nearly vertical line in the neighborhood of x = 2? Should this line be present? Why or why not?

Answer: The line should not be present. Some calculators "connect the dots" erroneously across points of discontinuity.

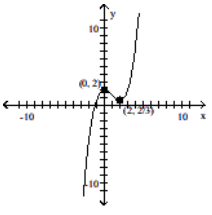
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

362) Sketch the graph of $y = -x^2$. At which of these points is the function decreasing?

A) 0 B) -3 C) -5 D) 3

Answer: D

363) For the graph shown, at which point does the function change from increasing to decreasing?



A) x = 0 B) x = 2 C) x = 2/3 D) x = -1.19

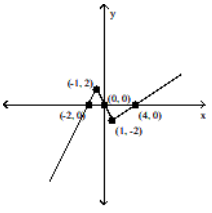
Answer: A

364) True or False. A continuous function may be drawn without lifting the pencil from the paper.

A) True B) False

Answer: A

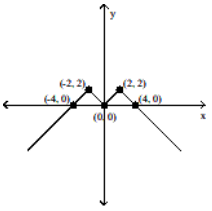
365) What are the x-intercepts of f(x + 2)?



A) -3, 0 B) -4, -2, 2 C) -4, 2 D) 0, 2, 6

Answer: B

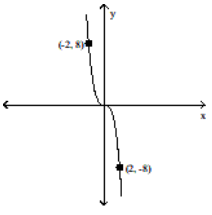
366) What symmetry does the graph of y = f(x) exhibit?



A) origin B) y-axis C) x-axis D) no symmetry

Answer: B

367) What symmetry does the graph of y = f(x) exhibit?



A) y-axis B) origin C) x-axis D) no symmetry

Answer: B

368) True or False. If the graph of y = f(x) is symmetric with respect to the y-axis, then the graph of y = -f(x) is not symmetric with respect to the y-axis.

A) True B) False

Answer: B

369) True or False. If the graph of y = f(x) is symmetric with respect to the origin, then the graph of y = f(-x) is not symmetric with respect to the origin.

A) True B) False

Answer: B