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

Determine whether the equation is linear or nonlinear.

1) $26x - \frac{1}{15} = 19$

A) linear B) nonlinear

Answer: A

2) $\frac{9}{x} + 1 = 7$

A) linear B) nonlinear

Answer: B

3) $\sqrt{5}x + 3 = 0$

A) linear B) nonlinear

Answer: A

4) $x^2 - 5 = 4$

A) linear B) nonlinear

Answer: B

5) $\frac{x - 4}{7x + 4} = 10$

A) linear B) nonlinear

Answer: B

6) $0.11x + 24 = 0.29$

A) linear B) nonlinear

Answer: A

Solve the equation.

7) $16x = -15 + 15x$

A) {0} B) {15} C) {-14} D) {-15}

Answer: D

8) $4x + 2 = 2x - 16$

A) {-9} B) {-8} C) {9} D) {8}

Answer: A

9) $-4x - 20 = -2x - 4$

A) {10} B) {-10} C) {-8} D) {8}

Answer: C

10) $-35 - 3x = -10 + 2x$

A) {-7} B) {-5} C) {5} D) {7}

Answer: B

11) $9x - (3x - 1) = 2$

A) $\left\{\frac{1}{12}\right\}$ B) $\left\{\frac{1}{6}\right\}$ C) $\left\{-\frac{1}{6}\right\}$ D) $\left\{-\frac{1}{12}\right\}$

Answer: B

12) $5(x + 2) = 6(x - 3)$

A) {-8} B) {6} C) {28} D) {-28}

Answer: C

13) $2(2x - 3) = 3(x + 4)$

A) {8} B) {18} C) {-18} D) {-6}

Answer: B

14) $-5x - 2 - 2 = -4(x + 9)$

A) {32} B) {13} C) {- 36} D) {- 32}

Answer: A

15) $-4x + 1 - 4(x + 1) = -6x + 1$

A) $\left\{-\frac{7}{4}\right\}$ B) $\left\{\frac{3}{5}\right\}$ C) {-6} D) {- 2}

Answer: D

16) $\frac{2}{5}x = 3 + \frac{1}{3}x$

A) {-45} B) {45} C) {90} D) {-90}

Answer: B

17) $\frac{1}{2}x - 1 = \frac{1}{3}x - 6$

A) $\left\{\frac{5}{6}\right\}$ B) {30} C) {- 30} D) $\left\{-\frac{5}{6}\right\}$

Answer: C

18) $\frac{-3x + 5}{2} + 1 = -\frac{6x}{7}$

A) $\left\{\frac{7}{3}\right\}$ B) $\left\{\frac{49}{33}\right\}$ C) $\left\{\frac{49}{9}\right\}$ D) $\left\{-\frac{7}{3}\right\}$

Answer: C

19) $-11x + 1.1 = -36.9 - 1.5x$

A) {-47} B) {4} C) {3.6} D) {3.5}

Answer: B

20) $0.10(70) + 0.70x = 0.40(70 + x)$

A) {80} B) {35} C) {60} D) {70}

Answer: D

21) $0.50x - 0.20(20 + x) = 1.00(20)$

A) {70} B) {40} C) {80} D) {90}

Answer: C

22) $(x + 2)(x - 1) = (x + 1)^2$

A) $\{-2\}$ B) $\{-3\}$ C) $\left\{\frac{3}{2}\right\}$ D) {3}

Answer: B

23) $x(5x - 1) = (5x + 1)(x - 3)$

A) $\left\{-\frac{3}{14}\right\}$ B) $\left\{-\frac{3}{4}\right\}$ C) {2} D) $\left\{-\frac{3}{13}\right\}$

Answer: D

24) $x(x^2 + 8) = 3 + x^3$

A) $\left\{\frac{3}{8}\right\}$ B) {3} C) {8} D) $\left\{\frac{8}{3}\right\}$

Answer: A

25) $\frac{x}{x - 4} - 4 = \frac{4}{x - 4}$

A) {4, -4} B) {4} C) no solution D) {-4}

Answer: C

26) $\frac{2x}{x^2 - 1} = \frac{3}{x^2 - 1} - \frac{4}{x + 1}$

A) $\left\{\frac{1}{2}\right\}$ B) $\left\{-\frac{1}{8}\right\}$ C) $\left\{-\frac{1}{6}\right\}$ D) $\left\{\frac{7}{6}\right\}$

Answer: D

27) $\frac{6}{5x} - \frac{1}{x+1} = \frac{3}{x(2x + 2)}$

A) {3} B) $\left\{\frac{3}{10}\right\}$ C) $\left\{\frac{3}{2}\right\}$ D) no solution

Answer: C

28) $\frac{6}{x + 4} - \frac{8}{x - 4} = \frac{8}{x^2 - 16}$

A) $\{2\sqrt{14}\}$ B) {64} C) {-32} D) {32}

Answer: C

29) $\frac{-3}{x - 7} = \frac{6}{x - 14} - \frac{-21}{x^2 - 21x + 98}$

A) {7, 14} B) {14} C) {7} D) no solution

Answer: D

Write the sentence as an equation. Let the variable x represent the number.

30) The sum of twice a number and 5 is 9.

A) $x + 10 = 9$ B) $2x + 5 = 9$ C) $10x = 9$ D) $2x - 5 = 9$

Answer: B

31) Three less than 4 times a number equals 17.

A) $x - 12 = 17$ B) $3 - 4x = 17$ C) $\frac{4x}{3} = 17$ D) $4x - 3 = 17$

Answer: D

32) The product of 6 and a number, increased by 3, is 21.

A) $6x + 3 = 21$ B) $18x = 21$ C) $6(x + 3) = 21$ D) $6x - 3 = 21$

Answer: A

33) The product of 4 and a number increased by 3 is 20.

A) $4x + 3 = 20$ B) $12x = 20$ C) $4(x + 3) = 20$ D) $4x - 3 = 20$

Answer: C

34) Three times a number is equal to 20 decreased by the number.

A) $3x = x - 20$ B) $3x = 20 - x$ C) $3 + x = 20 - x$ D) $3x = 20 + x$

Answer: B

Solve the problem.

35) Mary and her brother John collect foreign coins. Mary has four times the number of coins that John has. Together they have 150 foreign coins. Find how many coins Mary has.

A) 24 coins B) 120 coins C) 114 coins D) 30 coins

Answer: B

36) Center City East Parking Garage has a capacity of 253 cars more than Center City West Parking Garage. If the combined capacity for the two garages is 1219 cars, find the capacity for each garage.

A) Center City East: 483 cars
Center City West: 736 cars

B) Center City East: 736 cars
Center City West: 483 cars

C) Center City East: 746 cars
Center City West: 473 cars

D) Center City East: 473 cars
Center City West: 746 cars

Answer: B

37) During an intramural basketball game, Team A scored 19 fewer points than Team B. Together, both teams scored a total of 151 points. How many points did Team A score during the game?

A) 66 points B) 67 points C) 85 points D) 75 points

Answer: A

38) A rectangular carpet has a perimeter of 288 inches. The length of the carpet is 96 inches more than the width. What are the dimensions of the carpet?

A) 132 by 144 in. B) 84 by 108 in. C) 120 by 144 in. D) 120 by 24 in.

Answer: D

39) Don James wants to invest $59,000 to earn $6170 per year. He can invest in B-rated bonds paying 13% per year or in a Certificate of Deposit (CD) paying 7% per year. How much money should be invested in each to realize exactly $6170 in interest per year?

A) $25,000 in B-rated bonds and $34,000 in a CD
B) $35,000 in B-rated bonds and $24,000 in a CD
C) $24,000 in B-rated bonds and $35,000 in a CD
D) $34,000 in B-rated bonds and $25,000 in a CD

Answer: D

40) A bank loaned out $69,000, part of it at the rate of 15% per year and the rest at a rate of 8% per year. If the interest received was $7480, how much was loaned at 15%?

A) $40,000
B) $28,000
C) $29,000
D) $41,000

Answer: B

41) A college student earned $5900 during summer vacation working as a waiter in a popular restaurant. The student invested part of the money at 10% and the rest at 6%. If the student received a total of $478 in interest at the end of the year, how much was invested at 10%?

A) $3100
B) $983
C) $2800
D) $2950

Answer: A

42) Kevin invested part of his $10,000 bonus in a certificate of deposit that paid 6% annual simple interest, and the remainder in a mutual fund that paid 11% annual simple interest. If his total interest for that year was $900, how much did Kevin invest in the mutual fund?

A) $4000
B) $7000
C) $6000
D) $5000

Answer: C

43) The manager of a coffee shop has one type of coffee that sells for $7 per pound and another type that sells for $14 per pound. The manager wishes to mix 90 pounds of the $14 coffee to get a mixture that will sell for $10 per pound. How many pounds of the $7 coffee should be used?

A) 60 lb
B) 120 lb
C) 105 lb
D) 210 lb

Answer: B

44) The owners of a candy store want to sell, for $6 per pound, a mixture of chocolate-covered raisins, which usually sells for $3 per pound, and chocolate-covered macadamia nuts, which usually sells for $8 per pound. They have a 40-pound barrel of the raisins. How many pounds of the nuts should they mix with the barrel of raisins so that they hit their target value of $6 per pound for the mixture?

A) 52 lb
B) 64 lb
C) 56 lb
D) 60 lb

Answer: D

45) The manager of a candy shop sells chocolate covered peanuts for $6 per pound and chocolate covered cashews for $12 per pound. The manager wishes to mix 80 pounds of the cashews to get a cashew-peanut mixture that will sell for $7 per pound. How many pounds of peanuts should be used?

A) 200 lb
B) 480 lb
C) 240 lb
D) 400 lb

Answer: D

46) A chemist needs 190 milliliters of a 66% solution but has only 42% and 99% solutions available. Find how many milliliters of each that should be mixed to get the desired solution.

A) 80 mL of 42%; 110 mL of 99%
B) 110 mL of 42%; 80 mL of 99%
C) 70 mL of 42%; 120 mL of 99%
D) 120 mL of 42%; 70 mL of 99%

Answer: B

47) How much pure acid should be mixed with 9 gallons of a 50% acid solution in order to get an 80% acid solution?

A) 4.5 gal B) 22.5 gal C) 36 gal D) 13.5 gal

Answer: D

48) An airplane flies 450 miles with the wind and 330 against the wind in the same length of time. If the speed of the wind is 20, what is the speed of the airplane in still air?

A) 120 mph B) 55 mph C) 130 mph D) 135 mph

Answer: C

49) Two friends decide to meet in Chicago to attend a Cub's baseball game. Rob travels 126 miles in the same time that Carl travels 120 miles. Rob's trip uses more interstate highways and he can average 3 mph more than Carl. What is Rob's average speed?

A) 55 mph B) 71 mph C) 60 mph D) 63 mph

Answer: D

50) Two cars start from the same point and travel in the same direction. If one car is traveling 59 miles per hour and the other car is traveling at 52 miles per hour, how far apart will they be after 2.1 hours?

A) 109.2 mi B) 233.1 mi C) 14.7 mi D) 123.9 mi

Answer: C

51) Two trains leave a train station at the same time. One travels east at 12 miles per hour. The other train travels west at 7 miles per hour. In how many hours will the two trains be 114 miles apart?

A) 6.5 hr B) 12 hr C) 3 hr D) 6 hr

Answer: D

52) During a hurricane evacuation from the east coast of Georgia, a family traveled 250 miles west. For part of the trip, they averaged 50 mph, but as the congestion got bad, they had to slow to 30 mph. If the total time of travel was 9 hours, how many miles did they drive at the reduced speed?

A) 310 mi B) 300 mi C) 305 mi D) 295 mi

Answer: B

53) An experienced bank auditor can check a bank's deposits twice as fast as a new auditor. Working together it takes the auditors 4 hours to do the job. How long would it take the experienced auditor working alone?

A) 4 hr B) 6 hr C) 8 hr D) 12 hr

Answer: B

54) BJ can overhaul a boat's diesel inboard engine in 30 hours. His apprentice takes 60 hours to do the same job. How long would it take them working together assuming no gain or loss in efficiency?

A) 12 hr B) 90 hr C) 20 hr D) 8 hr

Answer: C

55) Tracy can wallpaper 5 rooms in a new house in 15 hours. Together with her trainee they can wallpaper the 5 rooms in 11 hours. How long would it take the trainee working by herself to do the job?

A) 35 hr B) 50 hr C) 70 hr D) 15 hr

Answer: A

Write the power of i as i, -1, -i, or 1.

56) i^8

A) 1 B) i C) -i D) -1

Answer: A

57) i^{15}

A) -i B) 1 C) i D) -1

Answer: A

58) i^{21}

A) 1 B) i C) -1 D) -i

Answer: B

59) i^{18}

A) -i B) 1 C) -1 D) i

Answer: C

Write the expression in the standard form a + bi.

60) (6 - 7i) + (3 + 3i)

A) 9 + 4i B) -9 + 4i C) 3 + 10i D) 9 - 4i

Answer: D

61) (6 + 6i) - (-7 + i)

A) -1 + 7i B) 13 + 5i C) 13 - 5i D) -13 - 5i

Answer: B

62) 8i + (-6 - i)

A) -6 + 7i B) -6 + 9i C) 6 - 9i D) 6 - 7i

Answer: A

63) 8i - (-3 - i)

A) -3 + 7i B) 3 + 9i C) 3 - 7i D) -3 - 9i

Answer: B

Perform the desired operation. Write the answer in the form a + bi.

64) 4(8 - 5i)

A) 32i - 5i B) 8 - 20i C) 32 - 20i D) 32 + 20i

Answer: C

65) 4i(8 - 5i)

A) $32i + 20i^2$ B) 20+ 32i C) $32i - 20i^2$ D) 32i- 20

Answer: B

66) -3i(-4 + 9i)

A) 27 + 12i B) $12i - 27i^2$ C) -27 + 12i D) $12i + 27i^2$

Answer: A

67) $(-4 + 8i)(4 + i)$

A) $-8 - 36i$ B) $-24 + 28i$ C) $-24 - 36i$ D) $-8 + 28i$

Answer: B

68) $(2 + 8i)(6 + 6i)$

A) $48i^2 + 60i + 12$ B) $60 + 36i$ C) $-36 + 60i$ D) $-36 - 60i$

Answer: C

69) $(8 + 2i)(6 - 6i)$

A) $60 - 36i$ B) $-12i^2 - 36i + 48$ C) $60 + 36i$ D) $36 + 60i$

Answer: A

70) $(6 + 7i)(6 - 7i)$

A) -13 B) $36 - 49i^2$ C) 85 D) $36 - 49i$

Answer: C

71) $(-2 + i)(-2 - i)$

A) -2 B) -3 C) 4 D) 5

Answer: D

72) $(5 + 2i)(5 - 2i)$

A) $25 - 4i^2$ B) $25 - 4i$ C) 29 D) 21

Answer: C

73) $(2 - 3i)^2$

A) $-5 - 12i$ B) $4 - 12i + 9i^2$ C) $13 - 12i$ D) -5

Answer: A

Find the product of the given complex number and its conjugate. Write the answer in the form a + bi.

74) $\frac{1}{5} - 2i$

A) $\frac{11}{5}$ B) $\frac{1}{25} + 4i$ C) $\frac{101}{25}$ D) $\frac{1}{25} - 4i$

Answer: C

75) $\sqrt{5} + 3i$

A) $5 + 9i$ B) 2 C) $5 - 9i$ D) 14

Answer: D

76) $\frac{\sqrt{2}}{3} + \frac{2}{3}i$

A) $\frac{2}{9} + \frac{4}{9}i$ B) $\frac{4}{3}$ C) $\frac{2}{9} - \frac{4}{9}i$ D) $\frac{2}{3}$

Answer: D

Write the expression in the standard form a + bi.

77) $\frac{2}{8+i}$

A) $\frac{16}{63}+\frac{2}{63}i$ B) $\frac{16}{63}-\frac{2}{63}i$ C) $\frac{16}{65}+\frac{2}{65}i$ D) $\frac{16}{65}-\frac{2}{65}i$

Answer: D

78) $\frac{4}{5-i}$

A) $\frac{10}{13}-\frac{2}{13}i$ B) $\frac{10}{13}+\frac{2}{13}i$ C) $\frac{5}{6}+\frac{1}{6}i$ D) $\frac{5}{6}-\frac{1}{6}i$

Answer: B

79) $\frac{2}{2-6i}$

A) $-\frac{1}{8}+\frac{3}{8}i$ B) $-\frac{1}{8}-\frac{3}{8}i$ C) $\frac{1}{10}+\frac{3}{10}i$ D) $\frac{1}{10}-\frac{3}{10}i$

Answer: C

80) $\frac{2i}{1-i}$

A) $-1-i$ B) $-1+2i$ C) $-1+i$ D) $1+i$

Answer: C

81) $\frac{4+5i}{5-4i}$

A) $-i$ B) i C) 1 D) -1

Answer: B

82) $\frac{35+13i}{5-4i}$

A) $3-5i$ B) $3+5i$ C) $5+3i$ D) $5-3i$

Answer: B

83) $\frac{6+2i}{7-9i}$

A) $-\frac{3}{8}+\frac{17}{16}i$ B) $\frac{12}{65}+\frac{34}{65}i$ C) $\frac{12}{13}+\frac{8}{13}i$ D) $-\frac{15}{8}+\frac{17}{16}i$

Answer: B

Perform the indicated operations and write the result in standard form.

84) $\sqrt{-49}+\sqrt{-81}$

A) -16 B) $16i$ C) $-16i$ D) $63i$

Answer: B

85) $\sqrt{-7} - \sqrt{-144}$

A) $\sqrt{7}i - 12$ B) $\sqrt{7}i - 12i$ C) $i(\sqrt{7} + 12)$ D) $i(\sqrt{7} - 12)$

Answer: D

86) $\sqrt{-4} \cdot \sqrt{-36}$

A) $-12i$ B) -12 C) 12 D) $12i^2$

Answer: B

87) $\frac{-36 + \sqrt{-108}}{6}$

A) $-6 - i\sqrt{3}$ B) $-6 + i\sqrt{6}$ C) $-6 + i\sqrt{3}$ D) $6 + i\sqrt{3}$

Answer: C

88) $\frac{-6 - \sqrt{-180}}{6}$

A) $1 + i\sqrt{5}$ B) $-1 - i\sqrt{5}$ C) $-1 + i\sqrt{5}$ D) $-1 - i\sqrt{6}$

Answer: B

Solve the equation by factoring.

89) $x^2 - 5x = 0$

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

Answer: A

90) $3x^2 - 8x = 0$

A) $\left\{\frac{8}{3}, -\frac{8}{3}\right\}$ B) $\left\{-\frac{8}{3}, 0\right\}$ C) $\{0\}$ D) $\left\{\frac{8}{3}, 0\right\}$

Answer: D

91) $x^2 + x - 20 = 0$

A) $\{4, 5\}$ B) $\{-5, -4\}$ C) $\{-5, 4\}$ D) $\{-4, 5\}$

Answer: C

92) $x^2 + 5 = 6x$

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

Answer: B

93) $x^2 - 6x - 7 = 0$

A) $\{-1, 7\}$ B) $\{1, 7\}$ C) $\{1, -7\}$ D) $\{-1, -7\}$

Answer: A

94) $3x^2 + 7x = 20$

A) $\left\{\frac{5}{3}, -4\right\}$ B) $\left\{-\frac{5}{3}, -4\right\}$ C) $\left\{-\frac{5}{3}, 4\right\}$ D) $\left\{\frac{5}{3}, 4\right\}$

Answer: A

Solve the equation using the square root property.

95) $x^2 - 81 = 0$

A) {-9} B) {9, -9} C) {81} D) {9}

Answer: B

96) $(x - 2)^2 = 49$

A) {9, -5} B) {-5, -9} C) {51} D) {7, -7}

Answer: A

97) $(x + 2)^2 - 4 = 0$

A) {-4} B) {-2, 2} C) {0} D) {-4, 0}

Answer: D

98) $(2x - 3)^2 - 49 = 0$

A) {10, -4} B) {4, -10} C) {5, -2} D) {2, -5}

Answer: C

99) $(2x + 5)^2 = 49$

A) {-6, 1} B) {-27, 27} C) {1, 6} D) {0, 1}

Answer: A

Decide what number must be added to the binomial to make a perfect square trinomial.

100) $x^2 + 14x$

A) 7 B) 25 C) 49 D) 98

Answer: C

101) $x^2 - 18x$

A) 162 B) 41 C) -9 D) 81

Answer: D

102) $x^2 + \frac{4}{5}x$

A) $\frac{4}{25}$ B) $\frac{16}{25}$ C) $\frac{1}{5}$ D) $\frac{8}{25}$

Answer: A

103) $x^2 - \frac{1}{2}x$

A) $-\frac{1}{8}$ B) $-\frac{1}{6}$ C) $\frac{1}{4}$ D) $\frac{1}{16}$

Answer: D

Solve the equation by completing the square.

104) $x^2 + 4x - 7 = 0$

A) $\{-2 - \sqrt{11}, -2 + \sqrt{11}\}$ B) $\{-2 - 1\sqrt{11}, -2 + 1\sqrt{11}\}$

C) $\{-1 - \sqrt{11}, -1 + \sqrt{11}\}$ D) $\{2 + \sqrt{11}\}$

Answer: A

105) $x^2 + 10x + 14 = 0$

A) $\{-10 + \sqrt{14}\}$

B) $\{5 + \sqrt{11}\}$

C) $\{5 - \sqrt{14}, 5 + \sqrt{14}\}$

D) $\{-5 - \sqrt{11}, -5 + \sqrt{11}\}$

Answer: D

106) $x^2 - 12x - 5 = 0$

A) $\{12 - \sqrt{149}, 12 + \sqrt{149}\}$

B) $\{6 - \sqrt{41}, 6 + \sqrt{41}\}$

C) $\{-6 - \sqrt{41}, -6 + \sqrt{41}\}$

D) $\{6 - \sqrt{5}, 6 + \sqrt{5}\}$

Answer: B

107) $x^2 + 3x - 9 = 0$

A) $\{-3 - 3\sqrt{5}, -3 + 3\sqrt{5}\}$

B) $\left\{\frac{-3 - 3\sqrt{5}}{2}\right\}$

C) $\left\{\frac{3 + 3\sqrt{5}}{2}\right\}$

D) $\left\{\frac{-3 - 3\sqrt{5}}{2}, \frac{-3 + 3\sqrt{5}}{2}\right\}$

Answer: D

108) $9x^2 + 36x + 20 = 0$

A) $\left\{\frac{2}{3}, \frac{10}{3}\right\}$

B) $\left\{-\frac{10}{3}, \frac{10}{3}\right\}$

C) $\left\{-\frac{2}{3}, -\frac{10}{3}\right\}$

D) $\left\{-\frac{2}{9}, -\frac{10}{9}\right\}$

Answer: C

109) $7x^2 - 2x - 4 = 0$

A) $\left\{-4, \frac{30}{7}\right\}$

B) $\left\{\frac{7 - \sqrt{29}}{49}, \frac{7 + \sqrt{29}}{49}\right\}$

C) $\left\{\frac{-1 - \sqrt{29}}{7}, \frac{-1 + \sqrt{29}}{7}\right\}$

D) $\left\{\frac{1 - \sqrt{29}}{7}, \frac{1 + \sqrt{29}}{7}\right\}$

Answer: D

Find the real solutions, if any, of the equation. Use the quadratic formula.

110) $x^2 + 8x - 3 = 0$

A) $\{4 + \sqrt{19}\}$

B) $\{-1 - \sqrt{19}, -1 + \sqrt{19}\}$

C) $\{-4 - \sqrt{19}, -4 + \sqrt{19}\}$

D) $\{-4 - 1\sqrt{19}, -4 + 1\sqrt{19}\}$

Answer: C

111) $x^2 - 4x - 7 = 0$

A) $\{4 + \sqrt{11}, 4 - \sqrt{11}\}$

B) $\{2 + \sqrt{11}, 2 - \sqrt{11}\}$

C) $\{-2 + \sqrt{11}, -2 - \sqrt{11}\}$

D) $\{2 + \sqrt{7}, 2 - \sqrt{7}\}$

Answer: B

112) $x^2 + x + 2 = 0$

A) $\left\{\frac{-1 - \sqrt{7}}{2}, \frac{-1 + \sqrt{7}}{2}\right\}$

B) $\left\{\frac{1 - \sqrt{7}}{2}, \frac{1 + \sqrt{7}}{2}\right\}$

C) $\left\{\frac{-1 - \sqrt{7}}{2}, \frac{1 + \sqrt{7}}{2}\right\}$

D) no real solution

Answer: D

113) $4x^2 + 17x - 15 = 0$

A) $\left\{-\frac{3}{4}, -5\right\}$ B) $\left\{-\frac{3}{4}, 5\right\}$ C) $\left\{\frac{3}{4}, -5\right\}$ D) $\left\{\frac{3}{4}, 5\right\}$

Answer: C

114) $4x^2 - x + 7 = 0$

A) $\left\{\frac{-1 - \sqrt{113}}{8}, \frac{1 + \sqrt{113}}{8}\right\}$ B) $\left\{\frac{-1 + \sqrt{113}}{8}, \frac{1 + \sqrt{113}}{8}\right\}$

C) no real solution D) $\left\{\frac{-1 - \sqrt{113}}{8}, \frac{-1 + \sqrt{113}}{8}\right\}$

Answer: C

115) $x^2 + 7x + 5 = 0$

A) $\left\{\frac{-7 - \sqrt{29}}{2}, \frac{-7 + \sqrt{29}}{2}\right\}$ B) $\left\{\frac{-7 - \sqrt{29}}{14}, \frac{-7 + \sqrt{29}}{14}\right\}$

C) $\left\{\frac{-7 - \sqrt{69}}{2}, \frac{-7 + \sqrt{69}}{2}\right\}$ D) $\left\{\frac{7 - \sqrt{29}}{2}, \frac{7 + \sqrt{29}}{2}\right\}$

Answer: A

116) $3x^2 + x - 7 = 0$

A) $\left\{\frac{1 - \sqrt{85}}{6}, \frac{1 + \sqrt{85}}{6}\right\}$ B) no real solution

C) $\left\{\frac{-1 - \sqrt{85}}{6}, \frac{-1 + \sqrt{85}}{6}\right\}$ D) $\left\{\frac{-1 - \sqrt{85}}{2}, \frac{-1 + \sqrt{85}}{2}\right\}$

Answer: C

117) $3x^2 + 12x + 1 = 0$

A) $\left\{\frac{-6 - \sqrt{39}}{3}, \frac{-6 + \sqrt{39}}{3}\right\}$ B) $\left\{\frac{-6 - \sqrt{33}}{6}, \frac{-6 + \sqrt{33}}{6}\right\}$

C) $\left\{\frac{-6 - \sqrt{33}}{3}, \frac{-6 + \sqrt{33}}{3}\right\}$ D) $\left\{\frac{-12 - \sqrt{33}}{3}, \frac{-12 + \sqrt{33}}{3}\right\}$

Answer: C

118) $16x^2 - 64x + 64 = 0$

A) no real solution B) $\{2, -32\}$ C) $\{-2\}$ D) $\{2\}$

Answer: D

Use the discriminant to determine the number and nature of the solutions to the quadratic equation. Do not solve the equation.

119) $x^2 - 6x - 7 = 0$

A) exactly one real solution B) two nonreal solutions C) two real solutions

Answer: C

120) $x^2 + 10x + 25 = 0$

A) two real solutions B) exactly one real solution C) two nonreal solutions

Answer: B

121) $x^2 - 4x + 5 = 0$

A) two real solutions B) two nonreal solutions C) exactly one real solution

Answer: B

122) $3x^2 - 3x + 4 = 0$

A) two nonreal solutions B) two real solutions C) exactly one real solution

Answer: A

123) $5x^2 - 3x - 1 = 0$

A) two nonreal solutions B) exactly one real solution C) two real solutions

Answer: C

Solve the problem.

124) The square of the difference between a number and 9 is 9. Find the number(s).

A) $6, 12$ B) $78, 84$ C) 12 D) 90

Answer: A

125) The product of 6 and the square of a number is 24. Find the number(s).

A) $-2\sqrt{6}, 2\sqrt{6}$ B) $2\sqrt{6}$ C) $-2, 2$ D) 2

Answer: C

126) A ball is thrown vertically upward from the top of a building 144 feet tall with an initial velocity of 128 feet per second. The distance s (in feet) of the ball from the ground after t seconds is $s = 144 + 128t - 16t^2$. After how many seconds will the ball pass the top of the building on its way down?

A) 10 sec B) 8 sec C) 7 sec D) 144 sec

Answer: B

127) As part of a physics experiment, Ming drops a baseball from the top of a 330-foot building. To the nearest tenth of a second, for how many seconds will the baseball fall? (Hint: Use the formula $h = 16t^2$, which gives the distance h, in feet, that a free-falling object travels in t seconds.)

A) 20.6 sec B) 82.5 sec C) 1.1 sec D) 4.5 sec

Answer: D

128) The length of a vegetable garden is 3 feet longer than its width. If the area of the garden is 54 square feet, find its dimensions.

A) 6 ft by 9 ft B) 5 ft by 8 ft C) 7 ft by 10 ft D) 5 ft by 10 ft

Answer: A

129) Find the dimensions of a rectangle whose perimeter is 38 meters and whose area is 84 square meters.

A) 8 m by 11 m B) 6 m by 11 m C) 7 m by 12 m D) 6 m by 13 m

Answer: C

130) Janet is training for a triathlon. Yesterday she jogged for 12 miles and then cycled another 31.5 miles. Her speed while cycling was 6 miles per hour faster than while jogging. If the total time for jogging and cycling was 3.75 hours, at what rate did she cycle?

A) 13 miles per hour B) 15 miles per hour C) 14 miles per hour D) 16 miles per hour

Answer: C

131) George and Matt have a painting business. George has less experience and it takes him 3 hours more to paint a medium sized room than it takes Matt. Working together they can paint a medium sized room in 6 hours. How long does it take each of them working individually? Round to the nearest tenth of an hour.

A) George: 12.0 hours, Matt: 9.0 hours
B) George: 14.5 hours, Matt: 11.5 hours
C) George: 12.9 hours, Matt: 9.9 hours
D) George: 13.7 hours, Matt: 10.7 hours

Answer: D

Find all solutions.

132) $x^3 - 36x = 0$

A) {0, 36}
B) {0, 6}
C) {0, 6, -6}
D) {0, -6}

Answer: C

133) $x^3 + 2x^2 - 9x - 18 = 0$

A) {-3, 3, 2}
B) {-3, 3, -2}
C) {9, -2}
D) {3, -2}

Answer: B

134) $x^3 + 2x^2 + 9x + 18 = 0$

A) {2}
B) {-3, 3, -2}
C) {-2}
D) no real solution

Answer: C

135) $x^3 - 7x^2 + 12x = 0$

A) {0, -3, -4}
B) {0, 3, 4}
C) {3, 4}
D) {-3, -4}

Answer: B

136) $x^3 + 2x^2 - x - 2 = 0$

A) {1, -2, 2}
B) {4}
C) {-1, 1, -2}
D) {-2, 2}

Answer: C

137) $6x^3 + 54x^2 + 120x = 0$

A) $\left\{-\frac{1}{4}, -5\right\}$
B) {0, 4, 5}
C) {-4, -5}
D) {0, -4, -5}

Answer: D

Solve the equation after making an appropriate substitution.

138) $x^4 - 50x^2 + 49 = 0$

A) {-49, 49}
B) {-50, 50}
C) {-1, 1, -7, 7}
D) {-7, 7}

Answer: C

139) $x^6 - 26x^3 - 27 = 0$

A) {27}
B) {3}
C) {-3, 1}
D) {3, -1}

Answer: D

140) $3(x + 1)^2 + 13(x + 1) + 4 = 0$

A) $\left\{-\frac{4}{3}, -4\right\}$
B) $\{0, 3\}$
C) $\left\{-\frac{1}{3}, -5\right\}$
D) $\left\{-\frac{4}{3}, -5\right\}$

Answer: D

141) $(4x - 4)^2 + 2(4x - 4) - 3 = 0$

A) $\left\{\frac{7}{4}, -\frac{3}{4}\right\}$ B) $\left\{-\frac{1}{4}, -\frac{5}{4}\right\}$ C) $\left\{-\frac{7}{4}, \frac{3}{4}\right\}$ D) $\left\{\frac{1}{4}, \frac{5}{4}\right\}$

Answer: D

142) $x + \sqrt{x} = 72$

A) {8} B) {9} C) {81} D) {64}

Answer: D

143) $x^{1/2} - 9x^{1/4} + 18 = 0$

A) {81, 1296} B) {9, 36} C) {-3, -6} D) {3, 6}

Answer: A

144) $3x^{-2} - 4x^{-1} - 4 = 0$

A) $\left\{-\frac{3}{2}, \frac{1}{2}\right\}$ B) $\left\{-\frac{2}{3}, -2\right\}$ C) $\left\{\frac{3}{2}, \frac{1}{2}\right\}$ D) $\left\{-\frac{2}{3}, 2\right\}$

Answer: A

145) $x^{2/3} - 7x^{1/3} + 10 = 0$

A) {-5, -2} B) {2, 5} C) {8, 125} D) {-125, -8}

Answer: C

146) $x^{2/3} + 2x^{1/3} - 8 = 0$

A) {-8, 64} B) {-64, 8} C) {-2, 4} D) {-4, 2}

Answer: B

Solve the radical equation.

147) $\sqrt{x + 1} = 8$

A) {63} B) {64} C) {81} D) {65}

Answer: A

148) $\sqrt{4x - 3} = 3$

A) $\left\{\frac{9}{4}\right\}$ B) $\left\{\frac{3}{2}\right\}$ C) {9} D) {3}

Answer: D

149) $\sqrt{4x + 5} = 5$

A) $\left\{\frac{15}{2}\right\}$ B) {5} C) {25} D) $\left\{\frac{25}{4}\right\}$

Answer: B

150) $\sqrt[3]{3x + 2} = -5$

A) $\left\{-\frac{127}{3}\right\}$ B) $\left\{\frac{23}{3}\right\}$ C) $\left\{-\frac{128}{3}\right\}$ D) $\left\{-\frac{125}{3}\right\}$

Answer: A

151) $\sqrt{8x + 33} = x$

A) $\left\{-\frac{33}{7}\right\}$ B) {11} C) {-3, 11} D) no real solution

Answer: B

152) $\sqrt{18x - 27} = x + 3$

A) {-6} B) {6} C) {-5} D) {7}

Answer: B

153) $\sqrt{2x + 3} - \sqrt{x + 1} = 1$

A) {-3, -1} B) {3, -1} C) {3} D) no real solution

Answer: B

154) $\sqrt{2x + 5} - \sqrt{x - 2} = 3$

A) {3, 8} B) {2} C) {2, 38} D) {-2}

Answer: C

155) $\sqrt{3x + 10} - \sqrt{x + 2} = 2$

A) {-2, 2} B) {-2} C) {-3} D) {2}

Answer: A

Solve the linear inequality. Express the solution in set-builder notation.

156) $2x + 6 < 14$

A) $\{x \mid x > 4\}$ B) $\{x \mid x < 4\}$ C) $\{x \mid x \leq 4\}$ D) $\{x \mid x \geq 4\}$

Answer: B

157) $-7x - 3 > -8x + 6$

A) $\{x \mid x > 9\}$ B) $\{x \mid x > 3\}$ C) $\{x \mid x < 3\}$ D) $\{x \mid x < 9\}$

Answer: A

158) $-7x + 7 \leq -8x + 3$

A) $\{x \mid x > -7\}$ B) $\{x \mid x < -7\}$ C) $\{x \mid x \leq -4\}$ D) $\{x \mid x \geq -4\}$

Answer: C

159) $24x - 24 > 6(3x - 6)$

A) $\{x \mid x > 24\}$ B) $\{x \mid x > -2\}$ C) $\{x \mid x < -2\}$ D) $\{x \mid x < 24\}$

Answer: B

160) $-4(2x + 12) < -12x - 36$

A) $\{x \mid x > -12\}$ B) $\{x \mid x < -12\}$ C) $\{x \mid x < 3\}$ D) $\{x \mid x > 3\}$

Answer: C

161) $\frac{5}{2}x + 4 < \frac{2}{5}$

A) $\left\{x \mid x < -\frac{36}{25}\right\}$ B) $\left\{x \mid x > -\frac{36}{25}\right\}$ C) $\left\{x \mid x > \frac{2}{5}\right\}$ D) $\left\{x \mid x < \frac{2}{5}\right\}$

Answer: A

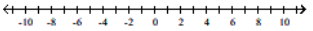
162) $-\frac{9}{8}x - \frac{5}{4} < -\frac{82}{9}$

A) $\left\{x \mid x > \frac{566}{81}\right\}$ B) $\left\{x \mid x < -\frac{82}{9}\right\}$ C) $\left\{x \mid x > -\frac{82}{81}\right\}$ D) $\left\{x \mid x > \frac{566}{9}\right\}$

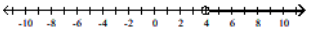
Answer: A

Solve the linear inequality. Graph the solution set on a number line, and express the solution using interval notation.

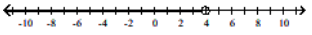
163) $2x + 3 < 11$



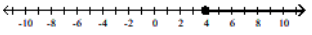
A) $(4, \infty)$



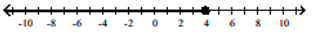
B) $(-\infty, 4)$



C) $[4, \infty)$



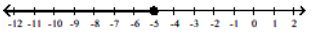
D) $(-\infty, 4]$



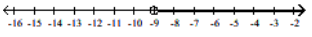
Answer: B

164) $5x - 2 > 4x - 7$

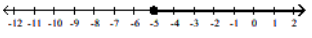
A) $(-\infty, -5]$



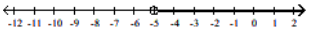
B) $(-9, \infty)$



C) $[-5, \infty)$



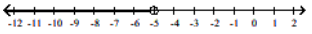
D) $(-5, \infty)$



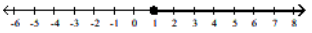
Answer: D

165) $-4x + 3 \leq -5x - 2$

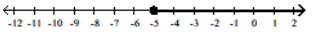
A) $(-\infty, -5)$



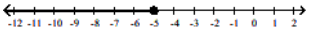
B) $[1, \infty)$



C) $[-5, \infty)$



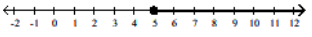
D) $(-\infty, -5]$



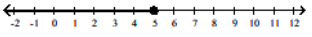
Answer: D

166) $-3x - 7 \geq -4x - 2$

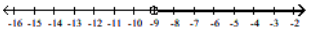
A) $[5, \infty)$



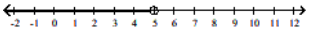
B) $(-\infty, 5]$



C) $(-9, \infty)$



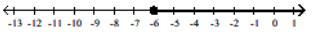
D) $(-\infty, 5)$



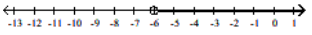
Answer: A

167) $-4x - 5 > -5x - 11$

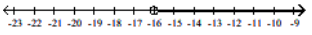
A) $[-6, \infty)$



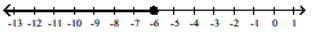
B) $(-6, \infty)$



C) $(-16, \infty)$

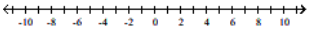


D) $(-\infty, -6]$

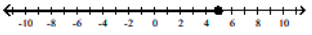


Answer: B

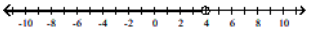
168) $11 - 3(3 - x) \leq 14$



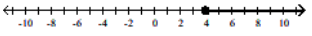
A) $(-\infty, 5]$



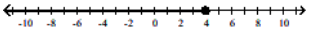
B) $(-\infty, 4)$



C) $[4, \infty)$

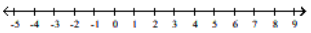


D) $(-\infty, 4]$

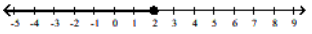


Answer: D

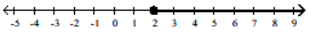
169) $-9x - 21 \leq -3(2x + 9)$



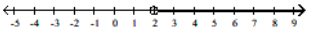
A) $(-\infty, 2]$



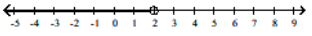
B) $[2, \infty)$



C) $[2, \infty)$



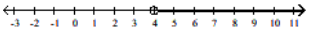
D) $(-\infty, 2)$



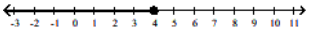
Answer: B

170) $-4(6x + 1) < -28x + 12$

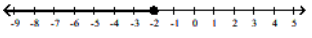
A) $(4, \infty)$



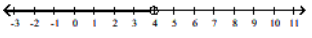
B) $(-\infty, 4]$



C) $(-\infty, -2]$

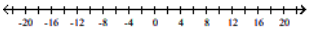


D) $(-\infty, 4)$

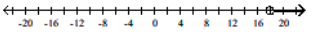


Answer: D

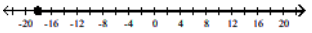
171) $\frac{1}{3}x \geq 5 + \frac{1}{18}x$



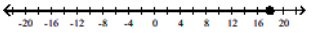
A) (18, ∞)



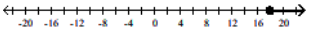
B) [-18, ∞)



C) (- ∞, 18]



D) [18, ∞)

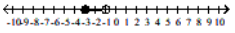


Answer: D

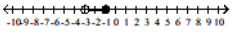
Solve the three-part linear inequality. Graph the solution set on a number line, and express the solution using interval notation.

172) $-1 < x - 2 \leq 1$

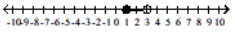
A) [-3, -1)



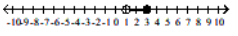
B) (-3, -1]



C) [1, 3)



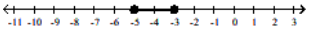
D) (1, 3]



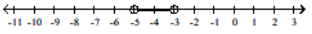
Answer: D

173) $9 \le 2x + 3 \le 13$

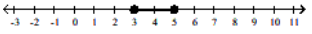
A) [-5, -3]



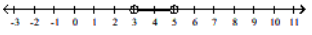
B) (-5, -3)



C) [3, 5]



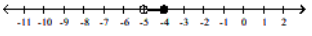
D) (3, 5)



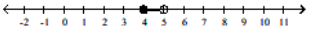
Answer: C

174) $-7 \le -2x + 3 < -5$

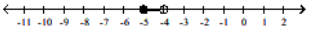
A) (-5, -4]



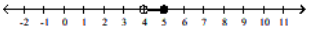
B) [4, 5)



C) [-5, -4)



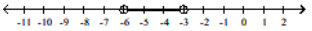
D) (4, 5]



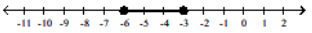
Answer: D

175) $-13 \le -3x + 5 \le -4$

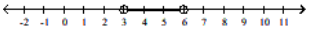
A) $(-6, -3)$



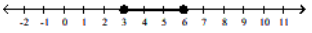
B) $[-6, -3]$



C) $(3, 6)$



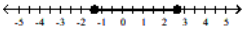
D) $[3, 6]$



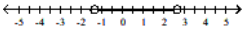
Answer: D

176) $0 \le \frac{3x + 4}{3} < 4$

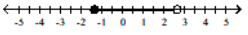
A) $\left[-\frac{4}{3}, \frac{8}{3}\right]$



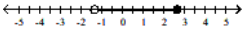
B) $\left(-\frac{4}{3}, \frac{8}{3}\right)$



C) $\left[-\frac{4}{3}, \frac{8}{3}\right)$



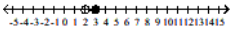
D) $\left(-\frac{4}{3}, \frac{8}{3}\right]$



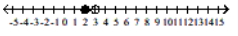
Answer: C

177) $15 \le \frac{7}{2}x + 8 < 29$

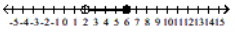
A) $(2, 3]$



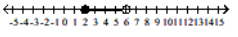
B) $[2, 3)$



C) $(2, 6]$



D) $[2, 6)$



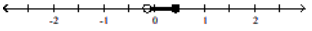
Answer: D

178) $-\frac{1}{3} \le \frac{7x-1}{6} < \frac{1}{3}$

A) $\left[-\frac{5}{21}, \frac{1}{3}\right)$

B) $\left(-\frac{1}{7}, \frac{3}{7}\right)$

C) $\left(-\frac{1}{7}, \frac{3}{7}\right]$



D) $\left[-\frac{1}{7}, \frac{3}{7}\right)$

Answer: D

Solve the compound inequality. Express the solution using interval notation or state that there is no solution.

179) $x - 3 \le 1$ and $x - 3 > -4$

A) $[-7, -2)$ B) $(-7, -2]$ C) $(-1, 4]$ D) $[-1, 4)$

Answer: C

180) $6x + 5 \ge 1$ and $7x - 4 < 8$

A) $\left[-\frac{2}{3}, \frac{12}{7}\right)$ B) $\left[-\frac{2}{3}, \frac{4}{7}\right)$ C) $\left(-\frac{2}{3}, \frac{12}{7}\right]$ D) $\left(-\frac{2}{3}, \frac{4}{7}\right]$

Answer: A

181) $7x - 9 > 5$ or $-x + 7 \ge -8$

A) $(-\infty, \infty)$ B) $[2, 15)$ C) $(2, \infty)$ D) $(2, 15]$

Answer: A

182) $-3x + 1 \ge 7$ or $6x + 3 \ge -21$

A) $[-4, -2]$ B) $(-\infty, \infty)$ C) $[-4, \infty)$ D) $[-2, \infty)$

Answer: B

Solve the problem.

183) During the first five months of the year, Len earned commissions of $3810, $2330, $3380, $2310, and $3420. If Len must have average monthly earnings of at least $3130 in order to qualify for retirement benefits, what must he earn in the sixth month in order to qualify for benefits?

A) at least $3130 B) at least $3050 C) at least $3063 D) at least $3530

Answer: D

184) Jim has gotten scores of 98 and 70 on his first two tests. What score must he get on his third test to keep an average of 80 or better?

A) at least 84 B) at least 72 C) at least 82 D) at least 70

Answer: B

185) When making a long distance call from a certain pay phone, the first three minutes of a call cost $2.95. After that, each additional minute or portion of a minute of that call costs $0.25. Use an inequality to find the number of minutes one can call long distance for $4.95.

A) 2 minutes or fewer B) 11 minutes or fewer

C) 20 minutes or fewer D) 8 minutes or fewer

Answer: B

186) A certain store has a fax machine available for use by its customers. The store charges $2.50 to send the first page and $0.70 for each subsequent page. Use an inequality to find the number of pages that can be faxed for $10.20.

A) 15 pages or fewer B) 12 pages or fewer C) 61 pages or fewer D) 4 pages or fewer

Answer: B

187) Claire has received scores of 85, 88, 87, and 75 on her algebra tests. What score must she receive on the fifth test to have an overall test score average of at least 83?

A) 78 or greater B) 81 or greater C) 80 or greater D) 79 or greater

Answer: C

188) ABC phone company charges $23 per month plus 3¢ per minute of phone calls. XYZ phone company charges $11 per month plus 6¢ per minute of phone calls. How many minutes of phone calls in a month make XYZ phone company the better deal?

A) Less than 40 minutes B) Less than 400 minutes

C) More than 40 minutes D) More than 400 minutes

Answer: B

Solve the equation.

189) $|x + 6| = 0$

A) $\{6, -6\}$ B) $\{-6\}$ C) $\{6\}$ D) no real solution

Answer: B

190) $|x + 4| = 2$

A) $\{-6, -2\}$ B) $\{2\}$ C) $\{6, -2\}$ D) no real solution

Answer: A

191) $|5x + 9| = 3$

A) $\left\{\frac{6}{5}, \frac{12}{5}\right\}$ B) $\left\{-\frac{2}{3}, -\frac{4}{3}\right\}$ C) $\left\{-\frac{6}{5}, -\frac{12}{5}\right\}$ D) no real solution

Answer: C

192) $|3 - 6x| = 9$

A) $\{-5, 1\}$ B) $\{-1, 2\}$ C) $\{-1, 5\}$ D) $\{-2, 1\}$

Answer: B

193) $|x^2 - 6x| = 0$

A) $\{-6, 0\}$ B) $\{0, 6\}$ C) $\{-6, 0, 6\}$ D) no real solution

Answer: B

194) $|x^2 - 4| = 0$

A) $\{-2\}$ B) $\{-2, 2\}$ C) $\{-16, 16\}$ D) $\{2\}$

Answer: B

195) $|x^2 + 13x - 7| = 7$

A) $\{-13, -1, 0, 14\}$ B) $\{-14, 14, -1, 1\}$ C) $\{-14, -13, 1\}$ D) $\{-14, -13, 0, 1\}$

Answer: D

Solve the inequality. Express your answer using interval notation.

196) $|x - 6| < 14$

A) $(-\infty, -8)$ B) $(-\infty, 20)$ C) $(-8, 20)$ D) $(-20, 8)$

Answer: C

197) $|8k - 2| \leq 7$

A) $\left(-\infty, -\frac{5}{8}\right] \cup \left[\frac{9}{8}, \infty\right)$ B) $\left(-\infty, \frac{9}{8}\right]$ C) $\left[-\frac{5}{8}, \frac{9}{8}\right]$ D) $\left(-\frac{5}{8}, \frac{9}{8}\right)$

Answer: C

198) $|x + 1| - 5 \leq 1$

A) $[-7, 1]$ B) no solution C) $(-7, 5)$ D) $[-7, 5]$

Answer: D

199) $|7k - 7| - 2 < 6$

A) $\left(-\infty, -\frac{1}{7}\right)$ B) $\left(-\frac{1}{7}, \frac{15}{7}\right)$ C) $\left(-\infty, \frac{15}{7}\right)$ D) $\left(-\infty, -\frac{1}{7}\right) \cup \left(\frac{15}{7}, \infty\right)$

Answer: B

200) $|x - 6| > 18$

A) $(-\infty, -12) \cup (24, \infty)$ B) $(24, \infty)$ C) $(-12, 24)$ D) $(-24, 12)$

Answer: A

201) $|2k - 8| \geq 9$

A) $\left[-\frac{1}{2}, \frac{17}{2}\right]$ B) $\left[\frac{17}{2}, \infty\right)$ C) $\left(-\infty, -\frac{1}{2}\right] \cup \left[\frac{17}{2}, \infty\right)$ D) $\left(-\frac{1}{2}, \frac{17}{2}\right)$

Answer: C

202) $|x - 7| + 4 \geq 6$

A) $[9, \infty)$ B) $(5, 9)$ C) $[5, 9]$ D) $(-\infty, 5] \cup [9, \infty)$

Answer: D

203) $|5k + 3| + 6 > 10$

A) $\left(\frac{1}{5}, \infty\right)$ B) $\left(-\frac{7}{5}, \frac{1}{5}\right)$ C) $\left(-\infty, -\frac{7}{5}\right) \cup \left(\frac{1}{5}, \infty\right)$ D) $\left(-\infty, -\frac{7}{5}\right] \cup \left[\frac{1}{5}, \infty\right)$

Answer: C

Solve the polynomial inequality. Express the solution in interval notation.

204) $(x - 1)(x + 8) > 0$

A) $(-8, \infty)$ B) $(-8, 1)$ C) $(-\infty, -1) \cup (8, \infty)$ D) $(-\infty, -8) \cup (1, \infty)$

Answer: D

205) $(x + 5)(x - 5) \le 0$

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

Answer: D

206) $x^2 + 5x + 6 > 0$

A) $(-\infty, -3) \cup (-2, \infty)$ B) $(-3, -2)$ C) $(-2, \infty)$ D) $(-\infty, -3)$

Answer: A

207) $x^2 - 3x - 10 \le 0$

A) $(-\infty, -2]$ B) $[-2, 5]$ C) $(-\infty, -2] \cup [5, \infty)$ D) $[5, \infty)$

Answer: B

208) $(x + 4)(x - 4)(x - 5) > 0$

A) $(-4, 4) \cup (5, \infty)$ B) $(-\infty, 4)$ C) $(-\infty, -4) \cup (4, 5)$ D) $(5, \infty)$

Answer: A

209) $(x + 7)(x + 4)(x - 5) < 0$

A) $(-\infty, -4)$ B) $(5, \infty)$ C) $(-\infty, -7) \cup (-4, 5)$ D) $(-7, -4) \cup (5, \infty)$

Answer: C

210) $x^3 - 4x^2 > 0$

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

Answer: A

211) $x^3 - 2x^2 - 35x > 0$

A) $(-5, \infty)$ B) $(-5, 0) \cup (7, \infty)$ C) $(-\infty, -5) \cup (0, 7)$ D) $(-7, 0) \cup (5, \infty)$

Answer: B

212) $2x^2 - 5x \ge 7$

A) $(-\infty, -1] \cup \left[\frac{7}{2}, \infty\right)$ B) $\left[-1, \frac{7}{2}\right]$ C) $\left(-1, \frac{7}{2}\right)$ D) $(-\infty, -1) \cup \left(\frac{7}{2}, \infty\right)$

Answer: A

213) $x^3 + 3x^2 > x + 3$

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

Answer: C

Solve the rational inequality. Express the solution in interval notation.

214) $\frac{x - 5}{x + 7} < 0$

A) $(-\infty, -7)$ B) $(-7, 5)$ C) $(-\infty, -7) \cup (5, \infty)$ D) $(5, \infty)$

Answer: B

215) $\frac{x - 5}{x + 1} > 0$

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

Answer: D

216) $\frac{x - 8}{x + 1} < 1$

A) $(-\infty, -1)$ B) $(-1, \infty)$ C) $(-\infty, -1) \cup (8, \infty)$ D) $(-1, 8)$

Answer: B

217) $\frac{x + 15}{x + 9} < 3$

A) $(-\infty, -9) \cup (9, \infty)$ B) $\left(-9, -6\right)$ C) $(-\infty, -9) \cup \left(-6, \infty\right)$ D) $\left(-\infty, -6\right) \cup (9, \infty)$

Answer: C

218) $\frac{4x - 3}{x + 7} \leq 3$

A) $(-7, 6)$ B) $(-7, 24)$ C) $(-7, 24]$ D) $(-7, 6]$

Answer: C

219) $\frac{(x + 9)(x - 7)}{x - 1} \geq 0$

A) $(-\infty, -9] \cup [7, \infty)$ B) $[-9, 1) \cup [7, \infty)$ C) $[-9, 1) \cup (1, 7]$ D) $(-\infty, -9] \cup (1, 7]$

Answer: B

220) $\frac{(x - 2)^2}{x^2 - 25} > 0$

A) $(-5, 2) \cup (2, 5)$ B) $(-\infty, -5) \cup (2, 5)$ C) $(-5, 2) \cup (5, \infty)$ D) $(-\infty, -5) \cup (5, \infty)$

Answer: D

221) $\frac{14}{x - 6} > \frac{12}{x + 1}$

A) $(-43, -1) \cup (6, \infty)$ B) $(-\infty, -43) \cup (-1, 6)$ C) $(-43, -1) \cup (-1, 6)$ D) $(-\infty, -43) \cup (6, \infty)$

Answer: A

222) $\frac{3x}{x + 5} < x$

A) $(-\infty, -5) \cup (0, \infty)$ B) $(-\infty, 2) \cup (5, \infty)$ C) $(-\infty, -5) \cup (-2, 0)$ D) $(-5, -2) \cup (0, \infty)$

Answer: D