

Chapter 1

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. Approximate the real-number expression. Express the answer in scientific notation accurate to four significant figures.

$$\sqrt{\left| 8.24 - 4.76 \times 10^4 \right| + 10^5}$$

- a. 3.672×10^3
 - b. 2.603×10^3
 - c. 4.264×10^2
 - d. 4.965×10^2
 - e. 3.842×10^2
- _____ 2. The two given numbers are coordinates of points A and B , respectively, on a coordinate line. Express the indicated statement as an inequality involving the absolute value symbol.

$x, -3$; $d(A, B)$ is at least 6

- a. $|-3 - x| \geq 6$
 - b. $|-3 + x| > 6$
 - c. $|-3 + x| \geq 6$
 - d. $|-3 - x| < 6$
 - e. $|-3 - x| \leq 6$
- _____ 3. Simplify the expression.

$$\left(\frac{-243x^5}{y^{-10}} \right)^{\frac{2}{5}}$$

- a. $-3x^2y^4$
 - b. $-9x^2y^4$
 - c. $9x^2y^4$
 - d. $3x^2y^4$
 - e. $-9x^4y^2$
- _____ 4. Rewrite the expression using a radical.

$$8 - y^{\frac{1}{8}}$$

- a. $8 - \sqrt{y}$

- b. $\sqrt{8-y}$
- c. $\sqrt[8]{8-y}$
- d. $\sqrt[8]{y} - \sqrt[8]{y}$
- e. $8 - \sqrt[8]{y}$

_____ 5. Approximate the real-number expression to four decimal places.

$$(-5.05)^{\frac{13}{3}}$$

- a. -1,116.8247
- b. -1,115.9247
- c. 1,115.9247
- d. 1,115.8247
- e. -1,115.8247

_____ 6. O'Carroll's formula is used to handicap weight lifters. If a lifter, who weighs b kilograms, lifts w kilograms of weight, then the handicapped weight W is given by:

$$W = \frac{w}{\sqrt[3]{b-35}}$$

Suppose two lifters weighing 73 kilograms and 89 kilograms lift weights of 273 kilograms and 210 kilograms, respectively. Use O'Carroll's formula to determine the superior weight lifter.

- a. the 73-kg lifter
- b. the 89-kg lifter

_____ 7. Express as a polynomial.

$$\frac{7x^5yz^6 - xy^3z}{xyz}$$

- a. $7x^6z^5 - y^3$
- b. $7x^4z^5 - y^3$
- c. $7x^6yz^5 - y^2$
- d. $7x^6z^5 - y^2$
- e. $7x^4z^5 - y^2$

_____ 8. Simplify the expression.

$$\frac{3a^2 + 20a + 25}{a^4 - 625} \div \frac{9a^2 + 30a + 25}{a^2 - 5a}$$

- a. $\frac{a}{(a^2 - 25)(3a - 5)}$
- b. $\frac{a}{(a^2 + 25)(3a - 5)}$

c. $\frac{1}{(a^2 - 25)(3a + 5)}$

d. $\frac{a}{(a^2 + 25)(3a + 5)}$

e. $\frac{a}{(a^2 - 25)(9a + 5)}$

____ 9. Express as a sum of terms of the form ax^r , where r is a rational number.

$$\frac{(x^2 + 6)^2}{x^5}$$

a. $x^{-1} + 6x^{-3} + 12x^{-5}$

b. $x^{-4} + 12x^{-2} + 36$

c. $x^{-1} + 12x^{-3} + 36x^{-5}$

d. $x + 12x^3 + 36x^5$

e. $x^4 + 12x^2 + 36$

____ 10. Express as a quotient.

$$x^{-1/5} - x^{9/5}$$

a. $\frac{1 - x^5}{x^{1/5}}$

b. $\frac{1 - x^2}{x^{1/5}}$

c. $\frac{1 - x^2}{x^{1/9}}$

d. $\frac{1 - x^9}{x^{1/5}}$

e. $\frac{1 - x^2}{x^{5/9}}$

____ 11. Solve the equation.

$$5x - 16 = 3(x - 2)$$

a. $x = 7$

b. $x = -2$

c. $x = 5$

d. $x = 11$

e. $x = -11$

____ 12. Solve the formula for p .

$$\frac{1}{g} = \frac{1}{w} + \frac{1}{p}$$

a. $p = \frac{gw}{w+g}$

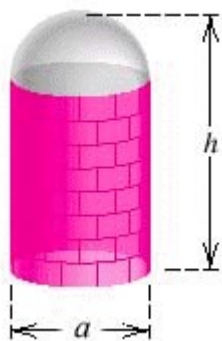
b. $p = \frac{g-w}{gw}$

c. $p = \frac{gw}{g-w}$

d. $p = \frac{gw}{w-g}$

e. $p = \frac{w-g}{gw}$

13. A large grain silo is to be constructed in the shape of a circular cylinder with a hemisphere attached to the top (see the figure). The diameter of the silo is to be 36 feet, but the height is yet to be determined. Find the height h of the silo that will result in a capacity of $15,876\pi \text{ ft}^3$.



- a. $h = 55$ feet
 b. $h = 60$ feet
 c. $h = 110$ feet
 d. $h = 43$ feet
 e. $h = 57$ feet
14. Archeologists can determine the height of a human without having a complete skeleton. If an archeologist finds only a humerus, then the height of the individual can be determined by using a simple linear relationship. (The humerus is the bone between the shoulder and the elbow.)

For a female, if x is the length of the humerus (in centimeters), then her height h (in centimeters) can be determined using the formula $h = 65 + 3.14x$.

For a male, $h = 73.6 + 3.0x$ should be used.

A female skeleton having a 31-centimeter humerus is found. Find the woman's height at death.

- a. $h = 157.04$ centimeters
 b. $h = 162.34$ centimeters

- c. $h = 107.6$ centimeters
- d. $h = 166.6$ centimeters
- e. $h = 99.14$ centimeters

_____ 15. Write the expression in the form $a + bi$, where a and b are real numbers.

$$(4 - 2i)^2$$

- a. $20 + 0i$
- b. $12 - 16i$
- c. $12 - 8i$
- d. $20 - 8i$
- e. $20 - 16i$

_____ 16. Find the solutions of the equation.

$$x^3 - 343 = 0$$

- a. 7
- b. $7, \pm 7i$
- c. $7, -\frac{7}{2} \pm \frac{7}{2}\sqrt{3}i$
- d. $7, \frac{7}{2} \pm \frac{7}{2}\sqrt{3}i$
- e. $7, -7 \pm 7\sqrt{3}i$

_____ 17. Find the solutions of the equation.

$$x^3 + 3x^2 + 5x = 0$$

- a. 0
- b. $0, -\frac{3}{2} \pm \frac{1}{2}\sqrt{11}i$
- c. $0, -\frac{3}{2} \pm \frac{1}{2}\sqrt{11}$
- d. $0, \frac{3}{2} \pm \frac{1}{2}\sqrt{11}i$
- e. no solutions

_____ 18. Express the inequality $-1 \geq x > -8$ as an interval.

- a. $[-1, -8)$
- b. $[-8, -1)$
- c. $[-8, -1]$
- d. $(-8, -1]$
- e. $(-8, -1)$

_____ 19. Express the interval $(2, 11)$ as an inequality in the variable x .

- a. $11 < x < 2$
- b. $2 < x \leq 11$

c. $2 \leq x < 11$

d. $2 \leq x \leq 11$

e. $2 < x < 11$

____ 20. Solve the inequality.

$$|2x + 13| \leq -13$$

a. $\left(-\infty, -\frac{13}{2}\right)$

b. $\left[-\frac{13}{2}, \frac{13}{2}\right]$

c. $\left(-\infty, \frac{13}{2}\right]$

d. $\left(-\frac{13}{2}, \frac{13}{2}\right)$

e. No solution

____ 21. Solve the inequality.

$$-2 < |x| < 9$$

a. $(-9, -2) \cup (2, 9)$

b. $(-9, 9)$

c. $(-2, 9)$

d. $(-\infty, -2) \cup (9, \infty)$

e. $(0, 9)$

____ 22. Solve the inequality.

$$(x + 2)(x - 4)(11 - x) \leq 0$$

a. $(-\infty, 4] \cup [2, \infty)$

b. $(-2, 4) \cup (11, \infty)$

c. $[-2, 4] \cup [11, \infty)$

d. $(-\infty, -2] \cup [4, 11]$

e. $(-\infty, 4) \cup (2, \infty)$

____ 23. Solve the inequality.

$$\frac{x - 2}{x^2 - 5x - 14} \geq 0$$

a. $[-2, 2] \cup (7, \infty)$

b. $(-2, \infty)$

c. $(-\infty, 2] \cup (7, \infty)$

d. $(-2, 2] \cup (7, \infty)$

e. $(-2, 7)$

_____ 24. Solve the inequality.

$$\frac{1}{x-3} \geq \frac{5}{x+6}$$

a. $(-\infty, -6) \cup (3, \infty]$

b. $(-6, 3)$

c. $(-6, 3) \cup \left[\frac{21}{4}, \infty \right)$

d. $(-\infty, -6) \cup \left[3, \frac{21}{4} \right]$

e. $(-\infty, -6) \cup (-6, 3) \cup \left[\frac{21}{4}, \infty \right)$

_____ 25. The braking distance d (in feet) of a certain car traveling v mi/hr is given by the equation $d = v + (v^2/40)$. Determine the velocities that result in braking distances of less than 30 feet.

a. $(0, 60)$

b. $(0, 20)$

c. $(20, 60)$

d. $(20, \infty)$

e. $(60, \infty)$

Chapter 1

Answer Section

MULTIPLE CHOICE

1. ANS: E	PTS: 1	MSC: scpf11.01.01.44am
2. ANS: A	PTS: 1	MSC: scpf11.01.01.21m
3. ANS: C	PTS: 1	MSC: scpf11.01.02.41m
4. ANS: E	PTS: 1	MSC: scpf11.01.02.55m
5. ANS: E	PTS: 1	MSC: scpf11.01.02.92m
6. ANS: B	PTS: 1	MSC: scpf11.01.02.99m
7. ANS: E	PTS: 1	MSC: scpf11.01.03.04m
8. ANS: D	PTS: 1	MSC: scpf11.01.03.34m
9. ANS: C	PTS: 1	MSC: scpf11.01.03.71m
10. ANS: B	PTS: 1	MSC: scpf11.01.03.75m
11. ANS: C	PTS: 1	MSC: scpf11.01.04.02m
12. ANS: D	PTS: 1	MSC: scpf11.01.04.57m
13. ANS: A	PTS: 1	MSC: scpf11.01.04.72m
14. ANS: B	PTS: 1	MSC: scpf11.01.04.76am
15. ANS: B	PTS: 1	MSC: scpf11.01.05.09m
16. ANS: C	PTS: 1	MSC: scpf11.01.05.48m
17. ANS: B	PTS: 1	MSC: scpf11.01.05.55m
18. ANS: D	PTS: 1	MSC: scpf11.01.06.03m
19. ANS: E	PTS: 1	MSC: scpf11.01.06.05m
20. ANS: E	PTS: 1	MSC: scpf11.01.06.24m
21. ANS: B	PTS: 1	MSC: scpf11.01.06.25m
22. ANS: C	PTS: 1	MSC: scpf11.01.06.28m
23. ANS: D	PTS: 1	MSC: scpf11.01.06.39m
24. ANS: D	PTS: 1	MSC: scpf11.01.06.45m
25. ANS: B	PTS: 1	MSC: scpf11.01.06.61m