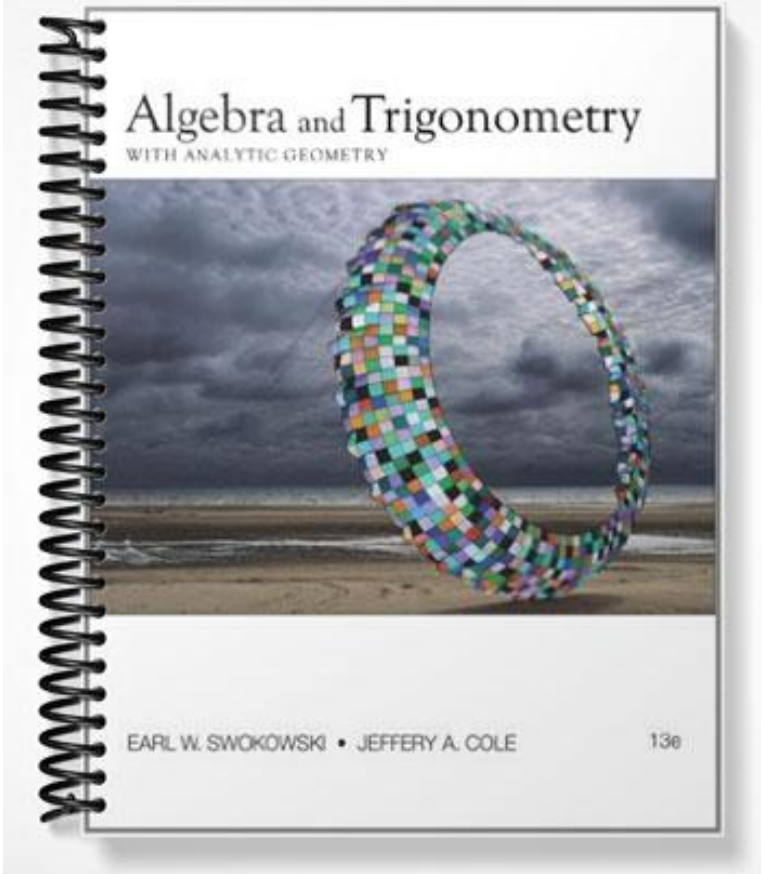
TEST BANK


Algebra and Trigonometry
WITH ANALYTIC GEOMETRY
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13e

Chapter 2

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

____ 1. Solve the equation.

$-7x + 4 = -5$

a. $x = -\frac{9}{7}$

b. $x = \frac{9}{7}$

c. $x = \frac{1}{7}$

d. $x = -\frac{1}{7}$

e. $x = -7$

____ 2. Solve the equation

$0.6(6 + 4x) + 1.5x = 3.8$

a. $x = -\frac{2}{39}$

b. $x = \frac{74}{39}$

c. $x = \frac{2}{39}$

d. $x = -\frac{13}{3}$

e. $x = \frac{13}{3}$

____ 3. Solve the equation.

$\frac{4}{y} + \frac{6}{y} - \frac{2}{y} = 3$

a. $y = \frac{8}{9}$

b. $y = -\frac{8}{3}$

c. $y = \frac{5}{3}$

d. $y = \frac{8}{3}$

e. $y = -\frac{8}{9}$

____ 4. Solve the equation.

$(4x + 8)(2x - 3) = 8x^2 - 11$

a. $x = -\frac{13}{4}$

b. $x = -\frac{5}{4}$

c. $x = \frac{5}{4}$

d. $x = \frac{13}{4}$

e. no solution

____ 5. Solve the equation.

$$\frac{9}{y^2-4} - \frac{3}{y+2} = \frac{2}{y-2}$$

a. $y = \frac{5}{11}$

b. $y = \frac{11}{5}$

c. $y = -\frac{11}{5}$

d. $y = \frac{5}{11}, -\frac{5}{11}$

e. $y = \frac{11}{5}, -\frac{11}{5}$

____ 6. Solve the formula for R.

$KR + T = Z - BR$

a. $R = \frac{T+Z}{K+B}$

b. $R = \frac{T-Z}{K+B}$

c. $R = \frac{Z-T}{K+B}$

d. $R = \frac{Z - T}{K - B}$

e. $R = \frac{Z + T}{K - B}$

____ 7. Solve the formula for *c*.

$R = 4n + 4c$

a. $c = \frac{4}{R - 4n}$

b. $c = \frac{R - n}{4}$

c. $c = \frac{R - 4n}{4}$

d. $c = \frac{4}{R + 4n}$

e. $c = \frac{R + 4n}{4}$

____ 8. Solve the formula for *d*.

$R = \frac{b}{d + b(1 - d)}$

a. $d = \frac{b(1 - R)}{R(1 - b)}$

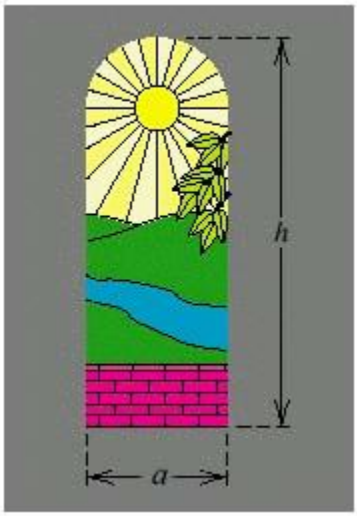
b. $d = \frac{b - R}{R(1 - b)}$

c. $d = \frac{b(1 + R)}{R(1 - b)}$

d. $d = \frac{b(1 - R)}{R(1 + b)}$

e. $d = \frac{b + R}{R(1 + b)}$

____ 9. A stained-glass window is being designed in the shape of a rectangle surmounted by a semicircle, as shown in the figure. The width of the window is to be 3 feet, but the height *h* is yet to be determined. If 27 ft ^{2} of glass is to be used, find the height *h*.



a. $h = 9.32$ feet
b. $h = 12.44$ feet
c. $h = 10.86$ feet
d. $h = 7.82$ feet
e. $h = 8.15$ feet

____ 10. Solve the equation by using the special quadratic equation.

$49x^2 = 169$

a. $x = \frac{13}{7}$
b. $x = \frac{13}{7}, x = -\frac{13}{7}$
c. $x = 13, x = -7$
d. $x = \frac{169}{49}, x = -\frac{169}{49}$
e. $x = -13, x = 7$

____ 11. Solve the equation by using the special quadratic equation.

$(x - 2)^2 = 11$

a. $x = 2 + \sqrt{11}, x = 2 - \sqrt{11}$
b. $x = 1 + \sqrt{14}, x = 1 - \sqrt{14}$
c. $x = \sqrt{13}, x = -\sqrt{13}$
d. $x = 11 + \sqrt{2}, x = 11 - \sqrt{2}$
e. $x = 2 + \sqrt{11}, x = 2 - \sqrt{14}$

____ 12. Two surveyors with two-way radios leave the same point at 9:00 A.M., one walking due south at 4 mi/hr and the other due west at 2 mi/hr. How long can they communicate with one another if each radio has a maximum range of 2.24 miles? Round the answer to the nearest minute.

a. 45 minutes
b. 30 minutes
c. 63 minutes
d. 87 minutes
e. 55 minutes

____ 13. Write the expression

$$\frac{-4 + 6i}{2 + 3i}$$

in the form $a + bi$, where a and b are real numbers.

a. $\frac{10}{13} + \frac{24i}{13}$
b. $\frac{10}{13} - \frac{24i}{13}$
c. $\frac{10}{13}$
d. $-\frac{10}{13} + \frac{24i}{13}$
e. $\frac{24i}{13}$

____ 14. Find the values of x and y, where x and y are real numbers.

$4 + (x + 5y)i = x + 29i$

a. $x = 4, y = 5$
b. $x = -4, y = 5$
c. $x = -4, y = -5$
d. $x = 5, y = -4$
e. $x = 4, y = -5$

____ 15. Find the solutions of the equation

$4x^2 - 40x + 136 = 0$

a. $x = 8 \pm 4i$
b. $x = 3 \pm 5i$
c. $x = 5 \pm 3i$
d. $x = 5 \pm i$
e. $x = -5 \pm 3i$

____ 16. Solve the equation

$y^{3/2} = 8y$

a. $\sqrt{8}, 0$
b. $8, 0$
c. $\sqrt{8}, -\sqrt{8}$
d. $64, 0$
e. 64

____ 17. Solve the equation

$$3x^4 - 39x^2 + 108 = 0$$

a. $x = \pm 3, \pm 2$
b. $x = \pm 9, \pm 4$
c. $x = 9, 4$
d. $x = 3, 2$
e. $x = -3, 4$

____ 18. Find the real solutions of the equation

$$x^{2/3} = 4$$

a. $x = \pm 4$
b. $x = 8$
c. $x = \pm 2$
d. $x = \pm 8$
e. $x = 2$

____ 19. Express the inequality $x \geq 8$ as an interval.

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

____ 20. Solve the inequality :

$$3 \geq 13x + 6 > -4$$

a. $\left(-\frac{10}{13}, \frac{3}{13} \right]$
b. $\left(-\frac{3}{13}, -\frac{10}{13} \right]$
c. $\left[-\frac{10}{13}, \frac{3}{13} \right)$
d. $\left(-\frac{10}{13}, -\frac{3}{13} \right]$
e. $\left(\frac{2}{13}, \frac{9}{13} \right]$

____ 21. Solve the inequality :

$|2x + 7| \leq -10$

a. $\left(-\infty, \frac{7}{2}\right]$
b. $\left(-\infty, -\frac{7}{2}\right)$
c. $\left[-\frac{7}{2}, \frac{7}{2}\right]$
d. $\left(-\frac{7}{2}, \frac{7}{2}\right)$
e. No solution

____ 22. Solve the inequality.

$x^2 - x - 2 < 0$

a. $(-\infty, -1) \cup (2, \infty)$
b. $(-2, 1)$
c. $(-1, 2)$
d. $(-\infty, -2) \cup (1, \infty)$
e. $(-\infty, -1)$

____ 23. Solve the inequality.

$\frac{x^2 - x}{x^2 + 19x} \leq 0$

a. $[-19, \infty)$
b. $[-19, 0) \cup (0, 1]$
c. $(-\infty, -19]$
d. $(-19, 0) \cup (0, 1]$
e. $(-19, 1]$

____ 24. Solve the inequality.

$\frac{1}{x - 3} \geq \frac{4}{x + 4}$

a. $\left(-\infty, -4\right) \cup (-4, 3) \cup \left[\frac{16}{3}, \infty\right)$
b. $(-4, 3)$
c. $(-4, 3) \cup \left[\frac{16}{3}, \infty\right)$
d. $(-\infty, -4) \cup \left(3, \infty\right]$
e. $(-\infty, -4) \cup \left(3, \frac{16}{3}\right]$

____ 25. As a particle moves along a straight path, its speed v (in cm/sec) at time t (in seconds) is given by the equation below. For what subintervals of the time interval [0, 9] will its speed be at least 4 cm/sec?

$v = t^3 - 7t^2 - 16t + 116$

a. $[-4, 4] \cup [7, 9]$
b. $[0, 4] \cup [7, 9]$
c. $[4, 9]$
d. $[0, 7]$
e. $[4, 7]$

Chapter 2
Answer Section

MULTIPLE CHOICE

1.	ANS: B	PTS: 1	MSC: scat12.02.01.4.01m
2.	ANS: C	PTS: 1	MSC: scat12.02.01.4.09m
3.	ANS: D	PTS: 1	MSC: scat12.02.01.4.16m
4.	ANS: D	PTS: 1	MSC: scat12.02.01.4.20m
5.	ANS: B	PTS: 1	MSC: scat12.02.01.4.31m
6.	ANS: C	PTS: 1	MSC: scat12.02.01.4.59m
7.	ANS: C	PTS: 1	MSC: scat12.02.01.4.69m
8.	ANS: A	PTS: 1	MSC: scat12.02.01.4.73m
9.	ANS: A	PTS: 1	MSC: scat12.02.02.4.27m
10.	ANS: B	PTS: 1	MSC: scat12.02.03.4.19m
11.	ANS: A	PTS: 1	MSC: scat12.02.03.4.21m
12.	ANS: B	PTS: 1	MSC: scat12.02.03.4.70m
13.	ANS: A	PTS: 1	MSC: scat12.02.04.4.23m
14.	ANS: A	PTS: 1	MSC: scat12.02.04.4.35m
15.	ANS: C	PTS: 1	MSC: scat12.02.04.4.40m
16.	ANS: D	PTS: 1	MSC: scat12.02.05.4.11m
17.	ANS: A	PTS: 1	MSC: scat12.02.05.4.36m
18.	ANS: D	PTS: 1	MSC: scat12.02.05.4.52bm
19.	ANS: D	PTS: 1	MSC: scat12.02.06.4.05m
20.	ANS: D	PTS: 1	MSC: scat12.02.06.4.30m
21.	ANS: E	PTS: 1	MSC: scat12.02.06.4.60m
22.	ANS: C	PTS: 1	MSC: scat12.02.07.4.05m
23.	ANS: D	PTS: 1	MSC: scat12.02.07.4.25m
24.	ANS: E	PTS: 1	MSC: scat12.02.07.4.33m
25.	ANS: B	PTS: 1	MSC: scat12.02.07.4.41m

Chapter 2

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

____ 1. Solve the equation.

$-9x + 6 = -1$

a. $x = -\frac{7}{9}$

b. $x = -\frac{5}{9}$

c. $x = \frac{5}{9}$

d. $x = \frac{7}{9}$

e. $x = \frac{9}{5}$

____ 2. Solve the equation

$0.6(6 + 4x) + 1.5x = 3.8$

a. $x = -\frac{13}{3}$

b. $x = \frac{13}{3}$

c. $x = \frac{2}{39}$

d. $x = \frac{74}{39}$

e. $x = -\frac{2}{39}$

____ 3. Solve the equation.

$\frac{5}{y} + \frac{6}{y} - \frac{5}{y} = 4$

a. $y = \frac{3}{2}$

b. $y = \frac{1}{2}$

c. $y = -\frac{1}{2}$

d. $y = -\frac{3}{2}$

e. $y = \frac{2}{3}$

____ 4. Solve the equation.

$(3x + 6)(3x - 2) = 9x^2 - 8$

a. $x = \frac{5}{6}$

b. $x = \frac{1}{3}$

c. $x = -\frac{1}{3}$

d. $x = -\frac{5}{6}$

e. no solution

____ 5. Solve the equation.

$$\frac{9}{y^2-4} - \frac{3}{y+2} = \frac{2}{y-2}$$

a. $y = -\frac{11}{5}$

b. $y = \frac{11}{5}, -\frac{11}{5}$

c. $y = \frac{5}{11}$

d. $y = \frac{11}{5}$

e. $y = \frac{5}{11}, -\frac{5}{11}$

____ 6. Solve the formula for P.

$KP + T = Y - CP$

a. $P = \frac{Y+T}{K-C}$

b. $P = \frac{T-Y}{K+C}$

c. $P = \frac{Y-T}{K+C}$

d. $P = \frac{Y - T}{K - C}$

e. $P = \frac{T + Y}{K + C}$

____ 7. Solve the formula for *a*.

$P = 6n + 6a$

a. $a = \frac{6}{P - 6n}$

b. $a = \frac{P + 6n}{6}$

c. $a = \frac{P - 6n}{6}$

d. $a = \frac{P - n}{6}$

e. $a = \frac{6}{P + 6n}$

____ 8. Solve the formula for *p*.

$R = \frac{c}{p + c(1 - p)}$

a. $p = \frac{c + R}{R(1 + c)}$

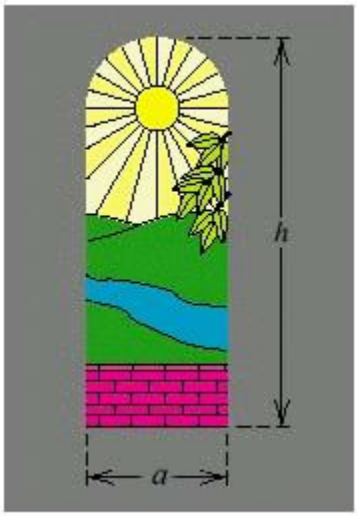
b. $p = \frac{c(1 - R)}{R(1 - c)}$

c. $p = \frac{c(1 - R)}{R(1 + c)}$

d. $p = \frac{c(1 + R)}{R(1 - c)}$

e. $p = \frac{c - R}{R(1 - c)}$

____ 9. A stained-glass window is being designed in the shape of a rectangle surmounted by a semicircle, as shown in the figure. The width of the window is to be 4 feet, but the height *h* is yet to be determined. If 25 ft ^{2} of glass is to be used, find the height *h*.



a. $h = 5.11$ feet
b. $h = 4.68$ feet
c. $h = 6.68$ feet
d. $h = 5.14$ feet
e. $h = 9.80$ feet

____ 10. Solve the equation by using the special quadratic equation.

$9x^2 = 121$

a. $x = \frac{11}{3}, x = -\frac{11}{3}$
b. $x = \frac{11}{3}$
c. $x = -11, x = 3$
d. $x = \frac{121}{9}, x = -\frac{121}{9}$
e. $x = 11, x = -3$

____ 11. Solve the equation by using the special quadratic equation.

$(x - 3)^2 = 7$

a. $x = 3 + \sqrt{7}, x = 3 - \sqrt{7}$
b. $x = 7 + \sqrt{3}, x = 7 - \sqrt{3}$
c. $x = \sqrt{10}, x = -\sqrt{10}$
d. $x = 3 + \sqrt{7}, x = 3 - \sqrt{10}$
e. $x = 2 + \sqrt{10}, x = 2 - \sqrt{10}$

____ 12. Two surveyors with two-way radios leave the same point at 9:00 A.M., one walking due south at 4 mi/hr and the other due west at 2 mi/hr. How long can they communicate with one another if each radio has a maximum range of 2.98 miles? Round the answer to the nearest minute.

a. 52 minutes
b. 116 minutes
c. 40 minutes
d. 73 minutes
e. 84 minutes

____ 13. Write the expression

$$\frac{-4 + 6i}{2 + 3i}$$

in the form $a + bi$, where a and b are real numbers.

a. $\frac{10}{13} + \frac{24i}{13}$
b. $\frac{10}{13} - \frac{24i}{13}$
c. $\frac{10}{13}$
d. $\frac{24i}{13}$
e. $-\frac{10}{13} + \frac{24i}{13}$

____ 14. Find the values of x and y, where x and y are real numbers.

$2 + (x + 7y)i = x + 9i$

a. $x = 1, y = -2$
b. $x = -2, y = -1$
c. $x = 2, y = 1$
d. $x = -2, y = 1$
e. $x = 2, y = -1$

____ 15. Find the solutions of the equation

$4x^2 - 32x + 260 = 0$

a. $x = 4 \pm 7i$
b. $x = 4 \pm i$
c. $x = 7 \pm 4i$
d. $x = 7 \pm 8i$
e. $x = -4 \pm 7i$

____ 16. Solve the equation

$y^{3/2} = 2y$

a. $4, 0$
b. 4
c. $\sqrt{2}, 0$
d. $2, 0$
e. $\sqrt{2}, -\sqrt{2}$

____ 17. Solve the equation

$$2x^4 - 26x^2 + 72 = 0$$

a. $x = 3, 2$
b. $x = \pm 3, \pm 2$
c. $x = \pm 9, \pm 4$
d. $x = 9, 4$
e. $x = -3, 4$

____ 18. Find the real solutions of the equation

$$x^{2/3} = 16$$

a. $x = \pm 4$
b. $x = 4$
c. $x = \pm 16$
d. $x = \pm 64$
e. $x = 64$

____ 19. Express the inequality $x \geq 5$ as an interval.

a. $[5, \infty)$
b. $(5, \infty)$
c. $(-5, 5)$
d. $(-\infty, 5]$
e. $[-5, 5]$

____ 20. Solve the inequality :

$$4 \geq 7x + 6 > -5$$

a. $\left(-\frac{11}{7}, -\frac{2}{7} \right]$
b. $\left[-\frac{11}{7}, \frac{2}{7} \right)$
c. $\left(\frac{1}{7}, \frac{10}{7} \right]$
d. $\left(-\frac{2}{7}, -\frac{11}{7} \right]$
e. $\left(-\frac{11}{7}, \frac{2}{7} \right]$

____ 21. Solve the inequality :

$|4x + 5| \leq -17$

a. $\left[-\frac{5}{4}, \frac{5}{4}\right]$
b. $\left(-\infty, \frac{5}{4}\right]$
c. $\left(-\infty, -\frac{5}{4}\right)$
d. $\left(-\frac{5}{4}, \frac{5}{4}\right)$
e. No solution

____ 22. Solve the inequality.

$x^2 - x - 90 < 0$

a. $(-\infty, -10) \cup (9, \infty)$
b. $(-\infty, -9) \cup (10, \infty)$
c. $(-\infty, -9)$
d. $(-10, 9)$
e. $(-9, 10)$

____ 23. Solve the inequality.

$\frac{x^2 - x}{x^2 + 18x} \leq 0$

a. $[-18, \infty)$
b. $[-18, 0) \cup (0, 1]$
c. $(-\infty, -18]$
d. $(-18, 1]$
e. $(-18, 0) \cup (0, 1]$

____ 24. Solve the inequality.

$\frac{1}{x - 1} \geq \frac{10}{x + 54}$

a. $(-54, 1) \cup \left[\frac{64}{9}, \infty\right)$
b. $(-54, 1)$
c. $(-\infty, -54) \cup \left(1, \infty\right]$
d. $\left(-\infty, -54\right) \cup (-54, 1) \cup \left[\frac{64}{9}, \infty\right)$
e. $(-\infty, -54) \cup \left(1, \frac{64}{9}\right]$

____ 25. As a particle moves along a straight path, its speed v (in cm/sec) at time t (in seconds) is given by the equation below. For what subintervals of the time interval [0, 8] will its speed be at least 15 cm/sec?

$v = t^3 - 6t^2 - 25t + 165$

a. $[-5, 5] \cup [6, 8]$
b. $[5, 6]$
c. $[0, 6]$
d. $[0, 5] \cup [6, 8]$
e. $[5, 8]$

Chapter 2
Answer Section

MULTIPLE CHOICE

1.	ANS: D	PTS: 1	MSC:	scat12.02.01.4.01m
2.	ANS: C	PTS: 1	MSC:	scat12.02.01.4.09m
3.	ANS: A	PTS: 1	MSC:	scat12.02.01.4.16m
4.	ANS: B	PTS: 1	MSC:	scat12.02.01.4.20m
5.	ANS: D	PTS: 1	MSC:	scat12.02.01.4.31m
6.	ANS: C	PTS: 1	MSC:	scat12.02.01.4.59m
7.	ANS: C	PTS: 1	MSC:	scat12.02.01.4.69m
8.	ANS: B	PTS: 1	MSC:	scat12.02.01.4.73m
9.	ANS: C	PTS: 1	MSC:	scat12.02.02.4.27m
10.	ANS: A	PTS: 1	MSC:	scat12.02.03.4.19m
11.	ANS: A	PTS: 1	MSC:	scat12.02.03.4.21m
12.	ANS: C	PTS: 1	MSC:	scat12.02.03.4.70m
13.	ANS: A	PTS: 1	MSC:	scat12.02.04.4.23m
14.	ANS: C	PTS: 1	MSC:	scat12.02.04.4.35m
15.	ANS: A	PTS: 1	MSC:	scat12.02.04.4.40m
16.	ANS: A	PTS: 1	MSC:	scat12.02.05.4.11m
17.	ANS: B	PTS: 1	MSC:	scat12.02.05.4.36m
18.	ANS: D	PTS: 1	MSC:	scat12.02.05.4.52bm
19.	ANS: A	PTS: 1	MSC:	scat12.02.06.4.05m
20.	ANS: A	PTS: 1	MSC:	scat12.02.06.4.30m
21.	ANS: E	PTS: 1	MSC:	scat12.02.06.4.60m
22.	ANS: E	PTS: 1	MSC:	scat12.02.07.4.05m
23.	ANS: E	PTS: 1	MSC:	scat12.02.07.4.25m
24.	ANS: E	PTS: 1	MSC:	scat12.02.07.4.33m
25.	ANS: D	PTS: 1	MSC:	scat12.02.07.4.41m

Chapter 2

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

____ 1. Solve the equation.

$-7x + 4 = -5$

a. $x = \frac{9}{7}$

b. $x = \frac{1}{7}$

c. $x = -\frac{9}{7}$

d. $x = -\frac{1}{7}$

e. $x = -7$

____ 2. Solve the equation

$0.6(6 + 5x) + 1.1x = 3.8$

a. $x = \frac{2}{41}$

b. $x = \frac{41}{19}$

c. $x = -\frac{41}{19}$

d. $x = \frac{74}{41}$

e. $x = -\frac{2}{41}$

____ 3. Solve the equation.

$\frac{5}{y} + \frac{6}{y} - \frac{5}{y} = 4$

a. $y = -\frac{3}{2}$

b. $y = -\frac{1}{2}$

c. $y = \frac{2}{3}$

d. $y = \frac{1}{2}$

e. $y = \frac{3}{2}$

____ 4. Solve the equation.

$(4x + 8)(3x - 5) = 12x^2 - 13$

a. $x = -\frac{27}{4}$

b. $x = \frac{53}{44}$

c. $x = \frac{27}{4}$

d. $x = -\frac{53}{44}$

e. no solution

____ 5. Solve the equation.

$$\frac{9}{y^2-4} - \frac{3}{y+2} = \frac{2}{y-2}$$

a. $y = \frac{5}{11}, -\frac{5}{11}$

b. $y = \frac{11}{5}$

c. $y = -\frac{11}{5}$

d. $y = \frac{11}{5}, -\frac{11}{5}$

e. $y = \frac{5}{11}$

____ 6. Solve the formula for R.

$JR + M = Y - AR$

a. $R = \frac{Y-M}{J+A}$

b. $R = \frac{M-Y}{J+A}$

c. $R = \frac{Y-M}{J-A}$

d. $R = \frac{M+Y}{J+A}$

e. $R = \frac{Y+M}{J-A}$

____ 7. Solve the formula for *a*.

$S = 5n + 5a$

a. $a = \frac{S-n}{5}$

b. $a = \frac{5}{S+5n}$

c. $a = \frac{5}{S-5n}$

d. $a = \frac{S-5n}{5}$

e. $a = \frac{S+5n}{5}$

____ 8. Solve the formula for *d*.

$V = \frac{a}{d + a(1-d)}$

a. $d = \frac{a+V}{V(1+a)}$

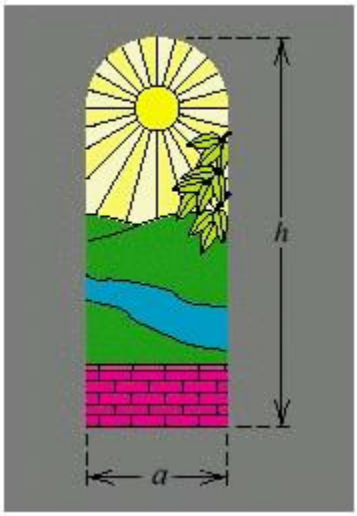
b. $d = \frac{a-V}{V(1-a)}$

c. $d = \frac{a(1-V)}{V(1+a)}$

d. $d = \frac{a(1-V)}{V(1-a)}$

e. $d = \frac{a(1+V)}{V(1-a)}$

____ 9. A stained-glass window is being designed in the shape of a rectangle surmounted by a semicircle, as shown in the figure. The width of the window is to be 2 feet, but the height *h* is yet to be determined. If 22 ft ^{2} of glass is to be used, find the height *h*.



a. $h = 10.43$ feet
b. $h = 12.76$ feet
c. $h = 14.34$ feet
d. $h = 10.22$ feet
e. $h = 11.22$ feet

____ 10. Solve the equation by using the special quadratic equation.

$49x^2 = 121$

a. $x = \frac{11}{7}, x = -\frac{11}{7}$
b. $x = -11, x = 7$
c. $x = 11, x = -7$
d. $x = \frac{121}{49}, x = -\frac{121}{49}$
e. $x = \frac{11}{7}$

____ 11. Solve the equation by using the special quadratic equation.

$(x - 3)^2 = 7$

a. $x = 3 + \sqrt{7}, x = 3 - \sqrt{7}$
b. $x = 3 + \sqrt{7}, x = 3 - \sqrt{10}$
c. $x = \sqrt{10}, x = -\sqrt{10}$
d. $x = 7 + \sqrt{3}, x = 7 - \sqrt{3}$
e. $x = 2 + \sqrt{10}, x = 2 - \sqrt{10}$

____ 12. Two surveyors with two-way radios leave the same point at 9:00 A.M., one walking due south at 4 mi/hr and the other due west at 2 mi/hr. How long can they communicate with one another if each radio has a maximum range of 2.24 miles? Round the answer to the nearest minute.

a. 55 minutes
b. 45 minutes
c. 87 minutes
d. 63 minutes
e. 30 minutes

____ 13. Write the expression

$$\frac{-4 + 6i}{2 + 5i}$$

in the form $a + bi$, where a and b are real numbers.

a. $\frac{22}{29} - \frac{32i}{29}$
b. $\frac{32i}{29}$
c. $\frac{22}{29}$
d. $-\frac{22}{29} + \frac{32i}{29}$
e. $\frac{22}{29} + \frac{32i}{29}$

____ 14. Find the values of x and y, where x and y are real numbers.

$$4 + (x + 2y)i = x + 22i$$

a. $x = 4, y = 9$
b. $x = -4, y = -9$
c. $x = 9, y = -4$
d. $x = -4, y = 9$
e. $x = 4, y = -9$

____ 15. Find the solutions of the equation

$$2x^2 - 8x + 40 = 0$$

a. $x = 2 \pm 4i$
b. $x = 4 \pm 2i$
c. $x = -2 \pm 4i$
d. $x = 5 \pm 5i$
e. $x = 2 \pm i$

____ 16. Solve the equation

$$y^{3/2} = 5y$$

a. $\sqrt{5}, -\sqrt{5}$
b. $25, 0$
c. 25
d. $\sqrt{5}, 0$
e. $5, 0$

____ 17. Solve the equation

$$4x^4 - 52x^2 + 144 = 0$$

a. $x = 2, 3$
b. $x = 4, 9$
c. $x = \pm 4, \pm 9$
d. $x = \pm 2, \pm 3$
e. $x = -2, 9$

____ 18. Find the real solutions of the equation

$$x^{2/3} = 4$$

a. $x = 8$
b. $x = 2$
c. $x = \pm 2$
d. $x = \pm 8$
e. $x = \pm 4$

____ 19. Express the inequality $x \geq 2$ as an interval.

a. $[2, \infty)$
b. $(-\infty, 2]$
c. $(2, \infty)$
d. $(-2, 2)$
e. $[-2, 2]$

____ 20. Solve the inequality :

$$4 \geq 7x + 6 > -5$$

a. $\left(-\frac{11}{7}, \frac{2}{7} \right]$
b. $\left(-\frac{2}{7}, -\frac{11}{7} \right]$
c. $\left(\frac{1}{7}, \frac{10}{7} \right]$
d. $\left(-\frac{11}{7}, -\frac{2}{7} \right]$
e. $\left[-\frac{11}{7}, \frac{2}{7} \right)$

____ 21. Solve the inequality :

$|2x + 7| \leq -18$

a. $\left(-\infty, \frac{7}{2}\right]$
b. $\left[-\frac{7}{2}, \frac{7}{2}\right]$
c. $\left(-\infty, -\frac{7}{2}\right)$
d. $\left(-\frac{7}{2}, \frac{7}{2}\right)$
e. No solution

____ 22. Solve the inequality.

$x^2 - x - 90 < 0$

a. $(-\infty, -9) \cup (10, \infty)$
b. $(-\infty, -10) \cup (9, \infty)$
c. $(-\infty, -9)$
d. $(-10, 9)$
e. $(-9, 10)$

____ 23. Solve the inequality.

$\frac{x^2 - x}{x^2 + 10x} \leq 0$

a. $[-10, \infty)$
b. $[-10, 0) \cup (0, 1]$
c. $(-10, 0) \cup (0, 1]$
d. $(-\infty, -10]$
e. $(-10, 1]$

____ 24. Solve the inequality.

$\frac{1}{x - 3} \geq \frac{10}{x + 25}$

a. $(-\infty, -25) \cup \left(3, \frac{55}{9}\right]$
b. $(-25, 3) \cup \left[\frac{55}{9}, \infty\right)$
c. $\left(-\infty, -25\right) \cup (-25, 3) \cup \left[\frac{55}{9}, \infty\right)$
d. $(-\infty, -25) \cup \left(3, \infty\right]$
e. $(-25, 3)$

____ 25. As a particle moves along a straight path, its speed v (in cm/sec) at time t (in seconds) is given by the equation below. For what subintervals of the time interval [0, 8] will its speed be at least 4 cm/sec?

$v = t^3 - 6t^2 - 25t + 154$

a. $[5, 8]$
b. $[0, 5] \cup [6, 8]$
c. $[-5, 5] \cup [6, 8]$
d. $[5, 6]$
e. $[0, 6]$

Chapter 2
Answer Section

MULTIPLE CHOICE

1.	ANS: A	PTS: 1	MSC:	scat12.02.01.4.01m
2.	ANS: A	PTS: 1	MSC:	scat12.02.01.4.09m
3.	ANS: E	PTS: 1	MSC:	scat12.02.01.4.16m
4.	ANS: C	PTS: 1	MSC:	scat12.02.01.4.20m
5.	ANS: B	PTS: 1	MSC:	scat12.02.01.4.31m
6.	ANS: A	PTS: 1	MSC:	scat12.02.01.4.59m
7.	ANS: D	PTS: 1	MSC:	scat12.02.01.4.69m
8.	ANS: D	PTS: 1	MSC:	scat12.02.01.4.73m
9.	ANS: E	PTS: 1	MSC:	scat12.02.02.4.27m
10.	ANS: A	PTS: 1	MSC:	scat12.02.03.4.19m
11.	ANS: A	PTS: 1	MSC:	scat12.02.03.4.21m
12.	ANS: E	PTS: 1	MSC:	scat12.02.03.4.70m
13.	ANS: E	PTS: 1	MSC:	scat12.02.04.4.23m
14.	ANS: A	PTS: 1	MSC:	scat12.02.04.4.35m
15.	ANS: A	PTS: 1	MSC:	scat12.02.04.4.40m
16.	ANS: B	PTS: 1	MSC:	scat12.02.05.4.11m
17.	ANS: D	PTS: 1	MSC:	scat12.02.05.4.36m
18.	ANS: D	PTS: 1	MSC:	scat12.02.05.4.52bm
19.	ANS: A	PTS: 1	MSC:	scat12.02.06.4.05m
20.	ANS: D	PTS: 1	MSC:	scat12.02.06.4.30m
21.	ANS: E	PTS: 1	MSC:	scat12.02.06.4.60m
22.	ANS: E	PTS: 1	MSC:	scat12.02.07.4.05m
23.	ANS: C	PTS: 1	MSC:	scat12.02.07.4.25m
24.	ANS: A	PTS: 1	MSC:	scat12.02.07.4.33m
25.	ANS: B	PTS: 1	MSC:	scat12.02.07.4.41m

Chapter 2

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

____ 1. Solve the equation.

$$\frac{10}{3}x - 3 = 27 + \frac{1}{3}x$$

a. $x = 8$

b. $x = -10$

c. $x = -\frac{72}{11}$

d. $x = \frac{72}{11}$

e. $x = 10$

____ 2. Solve the equation

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

a. $x = -\frac{5}{6}$

b. $x = \frac{6}{5}$

c. $x = -\frac{6}{5}$

d. $x = \frac{5}{6}$

e. no solution

____ 3. Solve the equation.

$$\frac{1}{3x + 12} = \frac{2}{6x + 24}$$

a. $x = -4$
b. $x = 4$
c. All real numbers except –4
d. All real numbers except 4
e. No solution

____ 4. Solve the formula for *L*.

$P = \frac{X}{L}$

a. $L = \frac{1}{PX}$
b. $L = \frac{P}{X}$
c. $L = \frac{X}{P}$
d. $L = XP$
e. none of these

____ 5. A student in an algebra course has test scores of 67, 80, 75, and 82. What score on the next test will raise the student's average to 80?

a. 99
b. 96
c. 76
d. 94
e. 75

____ 6. A person's intelligence quotient (IQ) is determined by multiplying the quotient of his or her mental age and chronological age by 100. Find the IQ of a 16 - year - old child whose mental age is 20.

a. 132 points of IQ
b. 135 points of IQ
c. 115 points of IQ
d. 125 points of IQ
e. 80 points of IQ

____ 7. A person's intelligence quotient (IQ) is determined by multiplying the quotient of his or her mental age and chronological age by 100. Find the mental age of a person 18 years old whose IQ is 140.

a. 23.2 years.
b. 12.9 years.
c. 25.2 years.
d. 28.2 years.
e. 27.2 years.

____ 8. British sterling silver is a copper-silver alloy that is 7.5% copper by weight. How many grams of pure copper and how many grams of British sterling silver should be used to prepare 157 grams of a copper-silver alloy that is 9% copper by weight?

a. 154.5 g of British sterling silver and 2.5 g of copper.
b. 148.4 g of British sterling silver and 8.6 g of copper.
c. 142.9 g of British sterling silver and 14.1 g of copper.
d. 134.3 g of British sterling silver and 22.7 g of copper.
e. 155.8 g of British sterling silver and 1.2 g of copper.

____ 9. A bullet is fired horizontally at a target, and the sound of its impact is heard 1.3 seconds later. If the speed of the bullet is 3,000 ft/sec and the speed of sound is 1,100 ft/sec, how far away is the target?

a. 1,430.0 ft
b. 1,046.3 ft

c. 2,853.7 ft
d. 1,438.0 ft
e. 1,161.3 ft

____ 10. Solve the equation by factoring.

$8x^2 + 2x - 15 = 0$

a. $x = \frac{3}{4}, x = -\frac{5}{2}$
b. $x = \frac{3}{2}, x = -\frac{5}{3}$
c. $x = 5, x = -3$
d. $x = 4, x = -2$
e. $x = \frac{5}{4}, x = -\frac{3}{2}$

____ 11. Solve the equation by factoring.

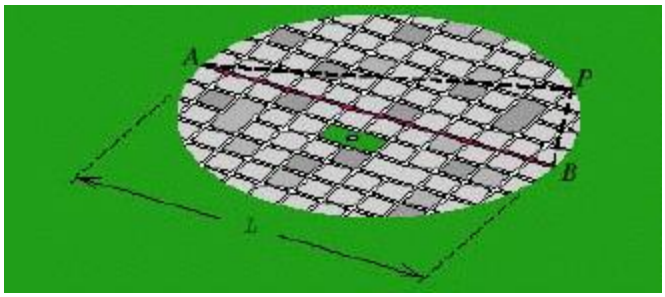
$x(12x + 13) = 35$

a. $x = 0, x = -\frac{13}{12}$
b. $x = \frac{5}{4}, x = -\frac{7}{3}$
c. $x = 5, x = -3$
d. $x = 35, x = -\frac{13}{12}$
e. $x = \frac{3}{1}, x = -\frac{5}{3}$

____ 12. A square vegetable garden is to be tilled and then enclosed with a fence. If the fence costs $3 per foot and the cost of preparing the soil is $0.60 per ft ^{2}, determine the width of the garden that can be enclosed for $852.60.

a. 34 ft
b. 33 ft
c. 29 ft
d. 64 ft
e. 12 ft

____ 13. The boundary of a city is a circle of diameter L = 9 miles. As shown in the figure, a straight highway runs through the center of the city from *A* to *B*. The highway department is planning to build a 10-mile-long freeway from *A* to a point *P* on the outskirts and then to *B*. Find the distance from *A* to *P*. (*Hint*: *APB* is a right triangle.) Round the answer to the nearest tenth of a mile.



a. $AP = 14.8$ mi or $AP = 1.8$ mi
b. $AP = 8.9$ mi or $AP = 1.1$ mi
c. $AP = 9.9$ mi or $AP = 1.1$ mi
d. $AP = 9.9$ mi or $AP = 1.2$ mi
e. $AP = 8.9$ mi or $AP = 1.8$ mi

____ 14. The speed of the current in a stream is 2.2 mi/hr. It takes a canoeist 40 minutes longer to paddle 1.9 miles upstream than to paddle the same distance downstream. What is the canoeist's rate in still water? Round the answer to the nearest tenth of a mile per hour.

a. 3.3 mi/hr
b. 6.3 mi/hr
c. 7.1 mi/hr
d. 2.2 mi/hr
e. 4.2 mi/hr

____ 15. During a nuclear explosion, a fireball will be produced having a maximum volume V_0. For temperatures below 2,000 K and a given explosive force, the volume V of the fireball t seconds after the explosion can be estimated using the given formula. (Note that the kelvin is abbreviated as K, not $^{\circ}$K.) Approximate t when V is 88% of V_0. Round the answer to the nearest thousandth of a second.

$$\frac{V}{V_0} = 0.831 + 0.00598t + 0.0000919t^2$$

a. 3.681 sec
b. 29.445 sec
c. 33.656 sec
d. 6.625 sec
e. 7.361 sec

____ 16. Write the expression

$$(6 - 2i)^2$$

in the form $a + bi$, where a and b are real numbers.

a. $32 - 12i$
b. $40 - 12i$
c. $40 + 0i$
d. $32 - 24i$
e. $40 - 24i$

____ 17. Write the expression

i^{41}

in the form $a + bi$, where *a* and *b* are real numbers.

a. i
b. 1
c. $-i$
d. 1 + i
e. - 1

____ 18. Find the values of *x* and *y*, where *x* and *y* are real numbers.

$4 + (x + 5y)i = x + 29i$

a. $x = 4, y = 5$
b. $x = -4, y = 5$
c. $x = -4, y = -5$
d. $x = 5, y = -4$
e. $x = 4, y = -5$

____ 19. Find the values of *x* and *y*, where *x* and *y* are real numbers.

$56 + (9x + y)i = 8x - 4i$

a. $x = -7, y = -67$
b. $x = -7, y = 67$
c. $x = 7, y = -67$
d. $x = -67, y = 7$
e. $x = -67, y = -7$

____ 20. Solve the equation

$\sqrt{2 - 6x} = 5$

a. $x = \pm \frac{9}{2}$

b. $x = \frac{9}{2}$

c. $x = \pm \frac{23}{6}$

d. $x = \frac{23}{6}$

e. $x = -\frac{23}{6}$

____ 21. Solve the equation

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

a. $x = 8, 36$
b. $x = 0, 8$
c. $x = 0$
d. $x = 36$
e. $x = 0, 36$

____ 22. A consumer is trying to decide whether to purchase car A or car B. Car A costs $10,000 and has an mpg rating of 30, and insurance is $450 per year. Car B costs $11,800 and has an mpg rating of 50, and insurance is $500 per year. Assume that the consumer drives 15,000 miles per year and that the price of gas remains constant at $1.25 per gallon. Based only on these facts, determine how long it will take for the total cost of car B to become less than that of car A.

a. 10 years
b. 31 years
c. 41 years
d. 18 years
e. 9 years

____ 23. Solve the inequality.

$x(6x+3) \geq 9$

a. $\left[-1, \frac{9}{6}\right]$
b. $\left(-\infty, -1\right] \cup \left[\frac{9}{6}, \infty\right)$
c. $\left(-\infty, -\frac{9}{6}\right] \cup \left[1, \infty\right)$
d. $\left[-\frac{9}{6}, 1\right]$
e. $\left[-\frac{9}{6}, \infty\right)$

____ 24. Solve the inequality.

$$\frac{(x+10)^2(5-x)}{(x+25)(x^2-25)} \leq 0$$

a. $(-\infty, -25) \cup \{-10\} \cup (5, \infty)$
b. $[-10, 5] \cup (25, \infty)$
c. $(-\infty, -25) \cup \{-10\} \cup (-5, \infty)$
d. $(-\infty, -25) \cup \{-10\} \cup (-5, 5) \cup (5, \infty)$
e. $(-\infty, -10] \cup \{5\}$

____ 25. The Lorentz contraction formula in relativity theory relates the length L of an object moving at a velocity of v mi/sec with respect to an observer to its length L_0 at rest. If c is the speed of light, then

$$L^2 = L_0^2\left(1 - \frac{v^2}{c^2}\right)$$

For what velocities will L be less than $\frac{1}{4}L_o$? State the answer in terms of c.

a. $v > \frac{3}{4}c$

b. $v > \frac{\sqrt{15}}{4}c$

c. $v > \frac{\sqrt{15}}{16}c$

d. $v < \frac{3}{4}c$

e. $v < \frac{\sqrt{15}}{4}c$

Chapter 2
Answer Section

MULTIPLE CHOICE

1.	ANS: E	PTS: 1	MSC:	scat12.02.01.4.08m
2.	ANS: A	PTS: 1	MSC:	scat12.02.01.4.18m
3.	ANS: C	PTS: 1	MSC:	scat12.02.01.4.29m
4.	ANS: C	PTS: 1	MSC:	scat12.02.01.4.68m
5.	ANS: B	PTS: 1	MSC:	scat12.02.02.4.01m
6.	ANS: D	PTS: 1	MSC:	scat12.02.02.4.05am
7.	ANS: C	PTS: 1	MSC:	scat12.02.02.4.05bm
8.	ANS: A	PTS: 1	MSC:	scat12.02.02.4.15m
9.	ANS: B	PTS: 1	MSC:	scat12.02.02.4.23m
10.	ANS: E	PTS: 1	MSC:	scat12.02.03.4.01m
11.	ANS: B	PTS: 1	MSC:	scat12.02.03.4.05m
12.	ANS: C	PTS: 1	MSC:	scat12.02.03.4.65m
13.	ANS: B	PTS: 1	MSC:	scat12.02.03.4.67m
14.	ANS: E	PTS: 1	MSC:	scat12.02.03.4.73m
15.	ANS: E	PTS: 1	MSC:	scat12.02.03.4.80m
16.	ANS: D	PTS: 1	MSC:	scat12.02.04.4.09m
17.	ANS: A	PTS: 1	MSC:	scat12.02.04.4.17m
18.	ANS: A	PTS: 1	MSC:	scat12.02.04.4.35m
19.	ANS: C	PTS: 1	MSC:	scat12.02.04.4.38m
20.	ANS: E	PTS: 1	MSC:	scat12.02.05.4.13m
21.	ANS: E	PTS: 1	MSC:	scat12.02.05.4.33m
22.	ANS: E	PTS: 1	MSC:	scat12.02.06.4.84m
23.	ANS: C	PTS: 1	MSC:	scat12.02.07.4.09m
24.	ANS: D	PTS: 1	MSC:	scat12.02.07.4.26m
25.	ANS: B	PTS: 1	MSC:	scat12.02.07.4.50m

Chapter 2

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

____ 1. Solve the equation.

$$\frac{7}{3}x - 4 = 10 + \frac{1}{3}x$$

a. $x = 7$

b. $x = -\frac{9}{4}$

c. $x = -7$

d. $x = \frac{9}{4}$

e. $x = 5$

____ 2. Solve the equation

$$(x + 4)^2 + 9 = (x - 2)^2$$

a. $x = \frac{7}{4}$

b. $x = -\frac{4}{7}$

c. $x = -\frac{7}{4}$

d. $x = \frac{4}{7}$

e. no solution

____ 3. Solve the equation.

$$\frac{1}{2x + 8} = \frac{3}{6x + 24}$$

a. $x = -4$
b. $x = 4$
c. All real numbers except –4
d. All real numbers except 4
e. No solution

____ 4. Solve the formula for *K*.

$R = \frac{X}{K}$

a. $K = XR$
b. $K = \frac{R}{X}$
c. $K = \frac{1}{RX}$
d. $K = \frac{X}{R}$
e. none of these

____ 5. A student in an algebra course has test scores of 69, 79, 75, and 80. What score on the next test will raise the student's average to 80?

a. 76
b. 97
c. 75
d. 94
e. 99

____ 6. A person's intelligence quotient (IQ) is determined by multiplying the quotient of his or her mental age and chronological age by 100. Find the IQ of a 18 - year - old child whose mental age is 21.6.

a. 110 points of IQ
b. 127 points of IQ
c. 130 points of IQ
d. 120 points of IQ
e. 83 points of IQ

____ 7. A person's intelligence quotient (IQ) is determined by multiplying the quotient of his or her mental age and chronological age by 100. Find the mental age of a person 18 years old whose IQ is 140.

a. 27.2 years.
b. 23.2 years.
c. 25.2 years.
d. 28.2 years.
e. 12.9 years.

____ 8. British sterling silver is a copper-silver alloy that is 7.5% copper by weight. How many grams of pure copper and how many grams of British sterling silver should be used to prepare 222 grams of a copper-silver alloy that is 15% copper by weight?

a. 197.9 g of British sterling silver and 24.1 g of copper.
b. 204.0 g of British sterling silver and 18.0 g of copper.
c. 183.8 g of British sterling silver and 38.2 g of copper.
d. 188.7 g of British sterling silver and 33.3 g of copper.
e. 205.3 g of British sterling silver and 16.7 g of copper.

____ 9. A bullet is fired horizontally at a target, and the sound of its impact is heard 1.3 seconds later. If the speed of the bullet is 3,000 ft/sec and the speed of sound is 1,100 ft/sec, how far away is the target?

a. 1,438.0 ft
b. 2,853.7 ft

c. 1,046.3 ft
d. 1,430.0 ft
e. 1,161.3 ft

____ 10. Solve the equation by factoring.

$16x^2 + 8x - 35 = 0$

a. $x = 4, x = -4$
b. $x = 5, x = -7$
c. $x = \frac{7}{4}, x = -\frac{5}{7}$
d. $x = \frac{7}{4}, x = -\frac{5}{4}$
e. $x = \frac{5}{4}, x = -\frac{7}{4}$

____ 11. Solve the equation by factoring.

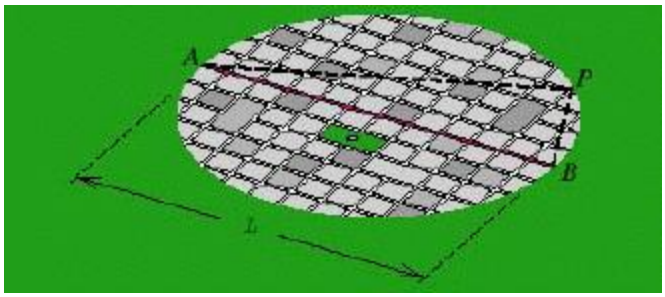
$x(6x + 11) = 35$

a. $x = \frac{4}{1}, x = -\frac{5}{2}$
b. $x = 35, x = -\frac{11}{6}$
c. $x = \frac{5}{3}, x = -\frac{7}{2}$
d. $x = 5, x = -2$
e. $x = 0, x = -\frac{11}{6}$

____ 12. A square vegetable garden is to be tilled and then enclosed with a fence. If the fence costs $1 per foot and the cost of preparing the soil is $0.20 per ft ^{2}, determine the width of the garden that can be enclosed for $403.20.

a. 14 ft
b. 41 ft
c. 79 ft
d. 36 ft
e. 40 ft

____ 13. The boundary of a city is a circle of diameter L = 7 miles. As shown in the figure, a straight highway runs through the center of the city from *A* to *B*. The highway department is planning to build a 8-mile-long freeway from *A* to a point *P* on the outskirts and then to *B*. Find the distance from *A* to *P*. (*Hint*: *APB* is a right triangle.) Round the answer to the nearest tenth of a mile.



a. $AP = 6.9$ mi or $AP = 1.1$ mi
b. $AP = 4.7$ mi or $AP = 0.7$ mi
c. $AP = 6.6$ mi or $AP = 1.1$ mi
d. $AP = 6.9$ mi or $AP = 0.7$ mi
e. $AP = 6.6$ mi or $AP = 1.0$ mi

____ 14. The speed of the current in a stream is 2.4 mi/hr. It takes a canoeist 60 minutes longer to paddle 1.7 miles upstream than to paddle the same distance downstream. What is the canoeist's rate in still water? Round the answer to the nearest tenth of a mile per hour.

a. 3.7 mi/hr
b. 4.9 mi/hr
c. 2.4 mi/hr
d. 3.1 mi/hr
e. 6.3 mi/hr

____ 15. During a nuclear explosion, a fireball will be produced having a maximum volume V_0. For temperatures below 2,000 K and a given explosive force, the volume V of the fireball t seconds after the explosion can be estimated using the given formula. (Note that the kelvin is abbreviated as K, not $^{\circ}$K.) Approximate t when V is 92% of V_0. Round the answer to the nearest thousandth of a second.

$$\frac{V}{V_0} = 0.831 + 0.00598t + 0.0000919t^2$$

a. 29.462 sec
b. 11.238 sec
c. 49.947 sec
d. 6.243 sec
e. 12.487 sec

____ 16. Write the expression

$$(5 - 4i)^2$$

in the form $a + bi$, where a and b are real numbers.

a. $9 - 40i$
b. $41 - 40i$
c. $41 + 0i$
d. $9 - 20i$
e. $41 - 20i$

____ 17. Write the expression

i^{33}

in the form $a + bi$, where *a* and *b* are real numbers.

a. 1 + i
b. - 1
c. - *i*
d. 1
e. *i*

____ 18. Find the values of *x* and *y*, where *x* and *y* are real numbers.

$7 + (x + 2y)i = x + 13i$

a. $x = 7, y = 3$
b. $x = 3, y = -7$
c. $x = -7, y = 3$
d. $x = -7, y = -3$
e. $x = 7, y = -3$

____ 19. Find the values of *x* and *y*, where *x* and *y* are real numbers.

$49 + (9x + y)i = 7x - 8i$

a. $x = -7, y = -71$
b. $x = -7, y = 71$
c. $x = -71, y = -7$
d. $x = 7, y = -71$
e. $x = -71, y = 7$

____ 20. Solve the equation

$\sqrt{8 - 2x} = 5$

a. $x = \pm \frac{33}{2}$

b. $x = -\frac{17}{2}$

c. $x = \pm \frac{17}{2}$

d. $x = \frac{17}{2}$

e. $x = \frac{33}{2}$

____ 21. Solve the equation

$\sqrt{1 + 5\sqrt{x}} = \sqrt{x} + 1$

a. $x = 0, 9$
b. $x = 0$
c. $x = 9$
d. $x = 0, 5$
e. $x = 5, 9$

____ 22. A consumer is trying to decide whether to purchase car A or car B. Car A costs $10,000 and has an mpg rating of 30, and insurance is $500 per year. Car B costs $11,600 and has an mpg rating of 50, and insurance is $550 per year. Assume that the consumer drives 15,000 miles per year and that the price of gas remains constant at $1.25 per gallon. Based only on these facts, determine how long it will take for the total cost of car B to become less than that of car A.

a. 27 years
b. 9 years
c. 8 years
d. 17 years
e. 37 years

____ 23. Solve the inequality.

$x(4x+5) \geq 9$

a. $\left(-\infty, -\frac{9}{4}\right] \cup \left[1, \infty\right)$
b. $\left[-1, \frac{9}{4}\right]$
c. $\left[-\frac{9}{4}, \infty\right)$
d. $\left(-\infty, -1\right] \cup \left[\frac{9}{4}, \infty\right)$
e. $\left[-\frac{9}{4}, 1\right]$

____ 24. Solve the inequality.

$$\frac{(x+8)^2(4-x)}{(x+16)(x^2-16)} \leq 0$$

a. $(-\infty, -16) \cup \{-8\} \cup (4, \infty)$
b. $(-\infty, -8] \cup \{4\}$
c. $[-8, 4] \cup (16, \infty)$
d. $(-\infty, -16) \cup \{-8\} \cup (-4, 4) \cup (4, \infty)$
e. $(-\infty, -16) \cup \{-8\} \cup (-4, \infty)$

____ 25. The Lorentz contraction formula in relativity theory relates the length L of an object moving at a velocity of v mi/sec with respect to an observer to its length L_0 at rest. If c is the speed of light, then

$$L^2 = L_0^2\left(1 - \frac{v^2}{c^2}\right)$$

For what velocities will L be less than $\frac{1}{2}L_o$? State the answer in terms of c.

a. $v > \frac{\sqrt{3}}{2}c$

b. $v > \frac{1}{2}c$

c. $v < \frac{\sqrt{3}}{2}c$

d. $v < \frac{1}{2}c$

e. $v > \frac{\sqrt{3}}{4}c$

Chapter 2
Answer Section

MULTIPLE CHOICE

1.	ANS: A	PTS: 1	MSC:	scat12.02.01.4.08m
2.	ANS: C	PTS: 1	MSC:	scat12.02.01.4.18m
3.	ANS: C	PTS: 1	MSC:	scat12.02.01.4.29m
4.	ANS: D	PTS: 1	MSC:	scat12.02.01.4.68m
5.	ANS: B	PTS: 1	MSC:	scat12.02.02.4.01m
6.	ANS: D	PTS: 1	MSC:	scat12.02.02.4.05am
7.	ANS: C	PTS: 1	MSC:	scat12.02.02.4.05bm
8.	ANS: B	PTS: 1	MSC:	scat12.02.02.4.15m
9.	ANS: C	PTS: 1	MSC:	scat12.02.02.4.23m
10.	ANS: E	PTS: 1	MSC:	scat12.02.03.4.01m
11.	ANS: C	PTS: 1	MSC:	scat12.02.03.4.05m
12.	ANS: D	PTS: 1	MSC:	scat12.02.03.4.65m
13.	ANS: A	PTS: 1	MSC:	scat12.02.03.4.67m
14.	ANS: A	PTS: 1	MSC:	scat12.02.03.4.73m
15.	ANS: E	PTS: 1	MSC:	scat12.02.03.4.80m
16.	ANS: A	PTS: 1	MSC:	scat12.02.04.4.09m
17.	ANS: E	PTS: 1	MSC:	scat12.02.04.4.17m
18.	ANS: A	PTS: 1	MSC:	scat12.02.04.4.35m
19.	ANS: D	PTS: 1	MSC:	scat12.02.04.4.38m
20.	ANS: B	PTS: 1	MSC:	scat12.02.05.4.13m
21.	ANS: A	PTS: 1	MSC:	scat12.02.05.4.33m
22.	ANS: C	PTS: 1	MSC:	scat12.02.06.4.84m
23.	ANS: A	PTS: 1	MSC:	scat12.02.07.4.09m
24.	ANS: D	PTS: 1	MSC:	scat12.02.07.4.26m
25.	ANS: A	PTS: 1	MSC:	scat12.02.07.4.50m

Chapter 2

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

____ 1. Solve the equation.

$$\frac{10}{3}x - 3 = 27 + \frac{1}{3}x$$

a. $x = 10$

b. $x = 8$

c. $x = -10$

d. $x = -\frac{72}{11}$

e. $x = \frac{72}{11}$

____ 2. Solve the equation

$$(x + 4)^2 + 9 = (x - 2)^2$$

a. $x = \frac{4}{7}$

b. $x = -\frac{4}{7}$

c. $x = \frac{7}{4}$

d. $x = -\frac{7}{4}$

e. no solution

____ 3. Solve the equation.

$$\frac{1}{2x+4} = \frac{3}{6x+12}$$

a. $x = 2$
b. $x = -2$
c. All real numbers except –2
d. All real numbers except 2
e. No solution

____ 4. Solve the formula for *L*.

$$R = \frac{Y}{L}$$

a. $L = YR$
b. $L = \frac{Y}{R}$
c. $L = \frac{1}{RY}$
d. $L = \frac{R}{Y}$
e. none of these

____ 5. A student in an algebra course has test scores of 68, 79, 74, and 82. What score on the next test will raise the student's average to 80?

a. 97
b. 75
c. 95
d. 100
e. 76

____ 6. A person's intelligence quotient (IQ) is determined by multiplying the quotient of his or her mental age and chronological age by 100. Find the IQ of a 16 - year - old child whose mental age is 21.6.

a. 145 points of IQ
b. 142 points of IQ
c. 125 points of IQ
d. 135 points of IQ
e. 74 points of IQ

____ 7. A person's intelligence quotient (IQ) is determined by multiplying the quotient of his or her mental age and chronological age by 100. Find the mental age of a person 12 years old whose IQ is 140.

a. 14.8 years.
b. 16.8 years.
c. 19.8 years.
d. 8.6 years.
e. 18.8 years.

____ 8. British sterling silver is a copper-silver alloy that is 7.5% copper by weight. How many grams of pure copper and how many grams of British sterling silver should be used to prepare 226 grams of a copper-silver alloy that is 13% copper by weight?

a. 192.4 g of British sterling silver and 33.6 g of copper.
b. 196.6 g of British sterling silver and 29.4 g of copper.
c. 206.5 g of British sterling silver and 19.5 g of copper.
d. 213.9 g of British sterling silver and 12.1 g of copper.
e. 212.6 g of British sterling silver and 13.4 g of copper.

____ 9. A bullet is fired horizontally at a target, and the sound of its impact is heard 1.3 seconds later. If the speed of the bullet is 3,000 ft/sec and the speed of sound is 1,100 ft/sec, how far away is the target?

a. 1,161.3 ft
b. 1,438.0 ft

c. 2,853.7 ft
d. 1,046.3 ft
e. 1,430.0 ft

____ 10. Solve the equation by factoring.

$12x^2 + 13x - 35 = 0$

a. $x = 5, x = -7$
b. $x = \frac{5}{4}, x = -\frac{7}{3}$
c. $x = \frac{7}{3}, x = -\frac{5}{7}$
d. $x = 4, x = -3$
e. $x = \frac{7}{4}, x = -\frac{5}{3}$

____ 11. Solve the equation by factoring.

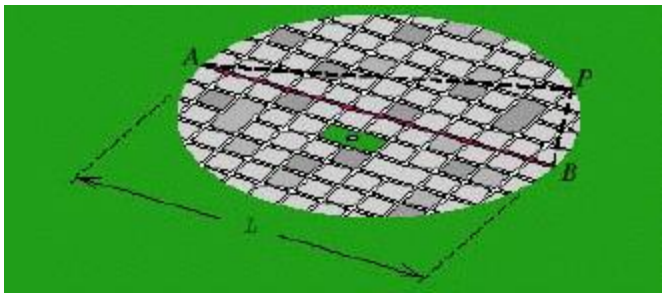
$x(18x + 9) = 35$

a. $x = \frac{2}{1}, x = -\frac{7}{3}$
b. $x = 7, x = -3$
c. $x = 35, x = -\frac{1}{2}$
d. $x = \frac{7}{6}, x = -\frac{5}{3}$
e. $x = 0, x = -\frac{1}{2}$

____ 12. A square vegetable garden is to be tilled and then enclosed with a fence. If the fence costs $1 per foot and the cost of preparing the soil is $0.60 per ft ^{2}, determine the width of the garden that can be enclosed for $582.40.

a. 33 ft
b. 11 ft
c. 30 ft
d. 28 ft
e. 48 ft

____ 13. The boundary of a city is a circle of diameter L = 4 miles. As shown in the figure, a straight highway runs through the center of the city from *A* to *B*. The highway department is planning to build a 5-mile-long freeway from *A* to a point *P* on the outskirts and then to *B*. Find the distance from *A* to *P*. (*Hint*: *APB* is a right triangle.) Round the answer to the nearest tenth of a mile.



a. $AP = 4.7$ mi or $AP = 1.2$ mi
b. $AP = 4.7$ mi or $AP = 1.4$ mi
c. $AP = 3.8$ mi or $AP = 1.2$ mi
d. $AP = 5.5$ mi or $AP = 1.7$ mi
e. $AP = 3.8$ mi or $AP = 1.7$ mi

____ 14. The speed of the current in a stream is 3.3 mi/hr. It takes a canoeist 30 minutes longer to paddle 1.9 miles upstream than to paddle the same distance downstream. What is the canoeist's rate in still water? Round the answer to the nearest tenth of a mile per hour.

a. 3.4 mi/hr
b. 7.2 mi/hr
c. 4.8 mi/hr
d. 9.0 mi/hr
e. 6.0 mi/hr

____ 15. During a nuclear explosion, a fireball will be produced having a maximum volume V_0. For temperatures below 2,000 K and a given explosive force, the volume V of the fireball t seconds after the explosion can be estimated using the given formula. (Note that the kelvin is abbreviated as K, not $^{\circ}$K.) Approximate t when V is 84% of V_0. Round the answer to the nearest thousandth of a second.

$$\frac{V}{V_0} = 0.831 + 0.00598t + 0.0000919t^2$$

a. 0.736 sec
b. 5.887 sec
c. 37.964 sec
d. 1.472 sec
e. 1.619 sec

____ 16. Write the expression

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

in the form $a + bi$, where a and b are real numbers.

a. $13 + 0i$
b. $13 - 6i$
c. $13 - 12i$
d. $5 - 6i$
e. $5 - 12i$

____ 17. Write the expression

i^{41}

in the form $a + bi$, where *a* and *b* are real numbers.

a. 1 + i
b. 1
c. - *i*
d. - 1
e. *i*

____ 18. Find the values of *x* and *y*, where *x* and *y* are real numbers.

$8 + (x + 6y)i = x + 44i$

a. $x = 6, y = -8$
b. $x = -8, y = 6$
c. $x = 8, y = -6$
d. $x = -8, y = -6$
e. $x = 8, y = 6$

____ 19. Find the values of *x* and *y*, where *x* and *y* are real numbers.

$3 + (9x + y)i = 3x - 6i$

a. $x = 1, y = -15$
b. $x = -15, y = 1$
c. $x = -1, y = -15$
d. $x = -1, y = 15$
e. $x = -15, y = -1$

____ 20. Solve the equation

$\sqrt{2 - 6x} = 5$

a. $x = \frac{9}{2}$

b. $x = \pm\frac{23}{6}$

c. $x = -\frac{23}{6}$

d. $x = \pm\frac{9}{2}$

e. $x = \frac{23}{6}$

____ 21. Solve the equation

$\sqrt{1 + 7\sqrt{x}} = \sqrt{x} + 1$

a. $x = 0, 25$
b. $x = 25$
c. $x = 7, 25$
d. $x = 0, 7$
e. $x = 0$

____ 22. A consumer is trying to decide whether to purchase car A or car B. Car A costs $10,000 and has an mpg rating of 30, and insurance is $500 per year. Car B costs $12,600 and has an mpg rating of 50, and insurance is $550 per year. Assume that the consumer drives 15,000 miles per year and that the price of gas remains constant at $1.25 per gallon. Based only on these facts, determine how long it will take for the total cost of car B to become less than that of car A.

a. 13 years
b. 17 years
c. 47 years
d. 57 years
e. 15 years

____ 23. Solve the inequality.

$x(4x+3) \geq 7$

a. $\left[-1, \frac{7}{4}\right]$
b. $\left(-\infty, -1\right] \cup \left[\frac{7}{4}, \infty\right)$
c. $\left[-\frac{7}{4}, \infty\right)$
d. $\left(-\infty, -\frac{7}{4}\right] \cup \left[1, \infty\right)$
e. $\left[-\frac{7}{4}, 1\right]$

____ 24. Solve the inequality.

$$\frac{(x+15)^2(4-x)}{(x+16)(x^2-16)} \leq 0$$

a. $(-\infty, -16) \cup \{-15\} \cup (4, \infty)$
b. $(-\infty, -15] \cup \{4\}$
c. $[-15, 4] \cup (16, \infty)$
d. $(-\infty, -16) \cup \{-15\} \cup (-4, 4) \cup (4, \infty)$
e. $(-\infty, -16) \cup \{-15\} \cup (-4, \infty)$

____ 25. The Lorentz contraction formula in relativity theory relates the length L of an object moving at a velocity of v mi/sec with respect to an observer to its length L_0 at rest. If c is the speed of light, then

$$L^2 = L_0^2\left(1 - \frac{v^2}{c^2}\right)$$

For what velocities will L be less than $\frac{1}{2}L_o$? State the answer in terms of c.

a. $v > \frac{1}{2}c$

b. $v > \frac{\sqrt{3}}{2}c$

c. $v < \frac{\sqrt{3}}{2}c$

d. $v > \frac{\sqrt{3}}{4}c$

e. $v < \frac{1}{2}c$

Chapter 2
Answer Section

MULTIPLE CHOICE

1.	ANS: A	PTS: 1	MSC: scat12.02.01.4.08m
2.	ANS: D	PTS: 1	MSC: scat12.02.01.4.18m
3.	ANS: C	PTS: 1	MSC: scat12.02.01.4.29m
4.	ANS: B	PTS: 1	MSC: scat12.02.01.4.68m
5.	ANS: A	PTS: 1	MSC: scat12.02.02.4.01m
6.	ANS: D	PTS: 1	MSC: scat12.02.02.4.05am
7.	ANS: B	PTS: 1	MSC: scat12.02.02.4.05bm
8.	ANS: E	PTS: 1	MSC: scat12.02.02.4.15m
9.	ANS: D	PTS: 1	MSC: scat12.02.02.4.23m
10.	ANS: B	PTS: 1	MSC: scat12.02.03.4.01m
11.	ANS: D	PTS: 1	MSC: scat12.02.03.4.05m
12.	ANS: D	PTS: 1	MSC: scat12.02.03.4.65m
13.	ANS: C	PTS: 1	MSC: scat12.02.03.4.67m
14.	ANS: E	PTS: 1	MSC: scat12.02.03.4.73m
15.	ANS: D	PTS: 1	MSC: scat12.02.03.4.80m
16.	ANS: E	PTS: 1	MSC: scat12.02.04.4.09m
17.	ANS: E	PTS: 1	MSC: scat12.02.04.4.17m
18.	ANS: E	PTS: 1	MSC: scat12.02.04.4.35m
19.	ANS: A	PTS: 1	MSC: scat12.02.04.4.38m
20.	ANS: C	PTS: 1	MSC: scat12.02.05.4.13m
21.	ANS: A	PTS: 1	MSC: scat12.02.05.4.33m
22.	ANS: A	PTS: 1	MSC: scat12.02.06.4.84m
23.	ANS: D	PTS: 1	MSC: scat12.02.07.4.09m
24.	ANS: D	PTS: 1	MSC: scat12.02.07.4.26m
25.	ANS: B	PTS: 1	MSC: scat12.02.07.4.50m