1. Determine whether the given values of the variables are solutions of the equation.

$2-5x=8+x$ (a) $x=0$ (b) $x=-1$

2. Solve the equation.

$4(x+6)+7 = -6(x+11)+67$

3. Solve the equation.

$$\frac{7}{x-8}+\frac{7}{x+8}=\frac{154}{x^2-64}$$

4. Solve the equation for t.

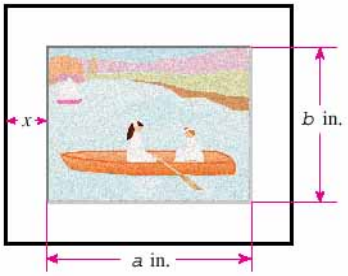
$P=a+art$

5. The average daily food consumption F of a herbivorous mammal with body weight x, where both F and x are measured in pounds, is given approximately by the equation $F=0.4x^{3/4}$. Find the weight x of an elephant that consumes 400 lb of food per day.

6. An executive in an engineering firm earns a monthly salary plus a Christmas bonus of $8,900. If she earns a total of $96,500 per year, what is her monthly salary?

7. A pasture is four times as long as it is wide. Its area is $230,400\,\text{ft}^2$. How wide is the pasture?

8. Catalina paints with watercolors on a sheet of paper a = 22 inches wide by b = 17 inches high. She then places this sheet on a mat so that a uniformly wide strip of the mat shows all around the picture. The perimeter of the mat is 102 inches. How wide is the strip of the mat showing around the picture?



9. What quantity of a 40% acid solution must be mixed with a 10% solution to produce 300 mL of a 30% solution?

10. Solve the equation by factoring.

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

11. Solve the equation by completing the square.

$x^2+4x-9/4=0$

12. Find all real solutions of the equation.

$x^2-\sqrt{53}x+1=0$

13. Use the discriminant to determine the number of real solutions of the equation.

$x^2 - 5.66x + 2.52 = 0$

14. Evaluate the expression $(5 + 10i)(7 - 9i)$ and write the result in the form $a + bi$.

15. Evaluate the expression $\dfrac{90}{9-3i}$ and write the result in the form $a + bi$.

16. Evaluate the expression i^{33} and write the result in the form $a + bi$.

17. Find all solutions of the equation and express them in the form $a + bi$.

$x^2 - 2x + 10 = 0$

18. Find all real solutions of the equation.

$x^4 = 4x^2$

19. Find all real solutions of the equation.

$$\frac{1}{x-7} - \frac{64}{x^2} = 0$$

20. Find all real solutions of the equation.

$$\sqrt{4x+25} + 5 = x$$

21. A jeweler has three small solid spheres made of gold, of radius 1 mm, 2 mm, and 3 mm. He decides to melt these down and make just one sphere out of them. What will the radius of this larger sphere be? Round the answer to one decimal place.

22. Solve the inequality. Express the solution using interval notation.

$-12 \le 9 - 3x \le 18$

23. A car rental company offers two plans for renting a car.

Plan A: \$40 per day and \$0.20 per mile.
Plan B: \$60 per day with free unlimited mileage.

For what range of miles will plan B save you money?

24. Solve the inequality. Express the solution using interval notation.

$|4x + 2| \ge 2$

25. Solve the equation.

$|x + 19| = |4x + 7|$

ANSWER KEY

Stewart/Redlin/Watson - Algebra and Trigonometry 4e Chapter 1 Form A

1. (a) no (b) yes

2. -3

3. 11

4. $t = \dfrac{P-a}{ar}$

5. 10,000 lb

6. $\$7,300$

7. 240 ft

8. 3

9. $200\,\text{mL}$

10. $x = -25,\ x = 20$

11. $x = -\dfrac{9}{2},\ x = \dfrac{1}{2}$

12. $x = \left(\sqrt{53} - 7\right)/2,\ x = \left(\sqrt{53} + 7\right)/2$

13. 2

14. $125 + 25i$

15. $9 + 3i$

16. i

17. $x = 1 \pm 3i$

18. $2, -2, 0$

19. 8,56

20. 14

21. $3.3\,\text{mm}$

22. $[-3, 7]$

23. $\text{miles} > 100$

24. $(-\infty, -1] \cup [0, \infty)$

25. $4,\ -\dfrac{26}{5}$

1. Determine whether the given value is a solution of the equation.

$\frac{1}{x} - \frac{1}{x-4} = 1, \ x = 2$

2. Solve the equation.

$4(x + 6) + 7 = - 6(x + 11) + 67$

3. The average daily food consumption F of a herbivorous mammal with body weight x, where both F and x are measured in pounds, is given approximately by the equation $F = 0.2x^{3/4}$. Find the weight x of an elephant that consumes 200 lb of food per day.

4. Solve the equation by factoring.

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

5. Find all real solutions of the equation.

$x^2 - \sqrt{53}x + 1 = 0$

6. Find all real solutions of the equation.

$x^4 = 4x^2$

7. Find all real solutions of the equation.

$\frac{1}{x-7} - \frac{64}{x^2} = 0$

8. Find all real solutions of the equation.

$\sqrt{4x + 25} + 5 = x$

9. Evaluate the expression i^{33} and write the result in the form $a + bi$.

10. Solve the equation for r.

$S = \frac{a}{1-r}$

11. Solve the equation.

$|x + 19| = |4x + 7|$

12. Solve the inequality. Express the answer using interval notation.

$|7x - 6| < 2$

13. What quantity of a 40% acid solution must be mixed with a 10% solution to produce 300 mL of a 30% solution?

14. Use the discriminant to determine the number of real solutions of the equation.

$x^2 - 5.66x + 2.52 = 0$

15. Solve the equation by completing the square.

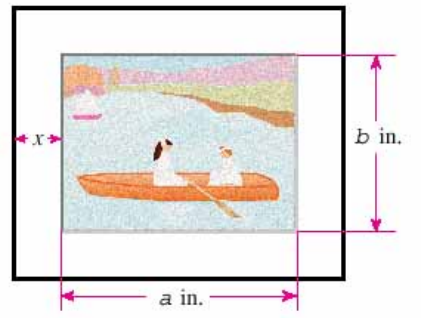
$x^2 + 4x - 9/4 = 0$

16. An executive in an engineering firm earns a monthly salary plus a Christmas bonus of $8,900. If she earns a total of $96,500 per year, what is her monthly salary?

17. A jeweler has three small solid spheres made of gold, of radius 1 mm, 2 mm, and 3 mm. He decides to melt these down and make just one sphere out of them. What will the radius of this larger sphere be? Round the answer to one decimal place.

18. Evaluate the expression $\frac{90}{9-3i}$ and write the result in the form $a + bi$.

19. Al paints with watercolors on a sheet of paper 22 inches wide by 17 inches high. He then places this sheet on a mat so that a uniformly wide strip of the mat shows all around the picture. The perimeter of the mat is 102 inches. How wide is the strip of the mat showing around the picture?



20. A pasture is four times as long as it is wide. Its area is $230,400\,\text{ft}^2$. How wide is the pasture?

21. Using calculus, it can be shown that if a ball is thrown upward with an initial velocity of 16 ft/s from the top of a building 256 ft high, then its height h above the ground t seconds later will be $h = 256 + 16t - 16t^2$. During what time interval will the ball be at least 64 ft above the ground

22. Evaluate the expression $(5 + 10i)(7 - 9i)$ and write the result in the form $a + bi$.

23. Find all solutions of the equation $x^2 - 2x + 5 = 0$ and express them in the form $a + bi$.

24. Solve the equation.

$5x - 3 = 6x + 4$

25. Solve the inequality. Express the solution using interval notation.

$-12 \le 9 - 3x \le 18$

ANSWER KEY

Stewart/Redlin/Watson - Algebra and Trigonometry 4e Chapter 1 Form B

1. yes

2. -3

3. 10,000 lb

4. $x = -25,\ x = 20$

5. $x = \left(\sqrt{53} - 7\right)/2,\ x = \left(\sqrt{53} + 7\right)/2$

6. $2, -2, 0$

7. 8, 56

8. 14

9. i

10. $r = \dfrac{S - a}{S}$

11. $4,\ \dfrac{-26}{5}$

12. $\left(4/7, 8/7\right)$

13. $200\,\text{mL}$

14. 2

15. $x = -\dfrac{9}{2},\ x = \dfrac{1}{2}$

16. \$7,300

17. $3.3\,\text{mm}$

18. $9 + 3i$

19. 3

20. 240 ft

21. $0 \le t \le 4\,\text{sec}$

22. $125 + 25i$

23. $1 + 2i, 1 - 2i$

24. -7

25. $[-3, 7]$

1. Determine which of the given choices is a solution of the equation.

$2-5x=8+x$

(a) 1 (b) - 1 (c) 0 (d) 2 (e) none of these

2. Solve the equation.

$3(x + 11) + 1 = - 3(x + 5) + 7$

(a) 3 (b) - 7 (c) 10 (d) 7 (e) - 18

3. Solve the equation.

$$\frac{10}{x-12}+\frac{9}{x+12}=\frac{126}{x^2-144}$$

(a) - 12 (b) 12 (c) 144 (d) 6 (e) 10

4. Solve the equation for h.

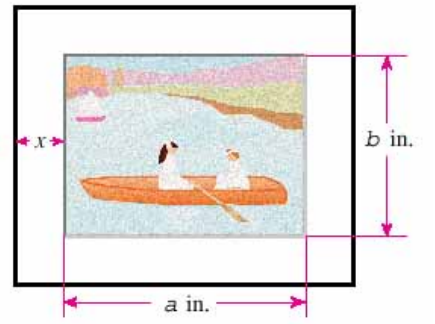
$A=2\pi rh+2\pi r^2$

(a) $h=\dfrac{A-r^2}{r}$ (b) $h=\dfrac{A-\pi r^2}{\pi r}$ (c) $h=\dfrac{A-2\pi r}{2\pi}$ (d) $h=A-r$ (e) none of these

5. The average daily food consumption F of a herbivorous mammal with body weight x, where both F and x are measured in pounds, is given approximately by the equation $F=0.4x^{3/4}$. Find the weight x of an elephant that consumes 400 lb of food per day.

(a) 15,000 lb (b) 20,000 lb (c) 10,000 lb (d) 5,000 lb (e) none of these

6. Caitlin paints with watercolors on a sheet of paper 28 inches wide by 16 inches high. She then places this sheet on a mat so that a uniformly wide strip of the mat shows all around the picture. The perimeter of the mat is 112 inches. How wide is the strip of the mat showing around the picture?



(a) 8 inches (b) 4 inches (c) 6 inches (d) 2 inches (e) 3 inches

7. What quantity of a 50% acid solution must be mixed with a 20% solution to produce 300 mL of a 40% solution?

(a) 100 mL (b) 180 mL (c) 120 mL (d) 240 mL (e) 200 mL

8. Solve the equation by factoring.

$6w^2 = 11w - 3$

(a) $w = 3/2,\ w = 3/5$
(b) $w = 1/5,\ w = 1/3$
(c) $w = 3/11,\ w = 3/2$
(d) $w = 3/2,\ w = 1/3$
(e) none of these

9. Solve the equation by completing the square.

$x^2 - 5x - 36 = 0$

(a) x = -9, x = -4 (b) x = 9, x = -4 (c) x = -9, x = -8 (d) x = 9, x = 4 (e) none of these

10. Solve the inequality.

$\left|\frac{x+5}{2}\right| \geq 5$

(a) $[-15, 5]$ (b) $[15, \infty)$ (c) $(-\infty, -15] \cup [5, \infty)$ (d) $(-\infty, -15) \cup (5, \infty)$ (e) $\varnothing$

11. Find all real solutions of the equation.

$x^2 - \sqrt{29}x + 1 = 0$

(a) $x = 12,\ x = -17/2$
(b) $x = \sqrt{29}/2,\ x = \sqrt{17}/2$
(c) $x = \sqrt{19}/2,\ x = -\sqrt{17}/2$
(d) $x = \frac{\sqrt{29} - 5}{2},\ x = \frac{\sqrt{29} + 5}{2}$
(e) none of these

12. Use the discriminant to determine the number of real solutions of the equation.

$x^2 - 5.79x + 2.37 = 0$

(a) no real solutions
(b) exactly one real solution
(c) two real solutions
(d) more than two real solutions
(e) none of these

13. Evaluate the expression $(4 + 7i)(11 - 4i)$ and write the result in the form $a + bi$.

(a) $72 + 61i$
(b) $44 + 77i$
(c) $61 + 72i$
(d) $-61 - 72i$
(e) none of these

14. Evaluate the expression $\frac{41}{4-5i}$ and write the result in the form $a + bi$.

(a) $4 + 5i$ (b) $4 - 5i$ (c) $- 5 - 4i$ (d) $5 + 4i$ (e) none of these

15. Evaluate the expression i^{43} and write the result in the form $a + bi$.

(a) -1 (b) 1 (c) i (d) $-i$ (e) none of these

16. Find all solutions of the equation $x^2 - 2x + 10 = 0$ and express them in the form $a + bi$.

(a) $x = 3 + 2i$, $x = 3 - 2i$
(b) $x = 1 + 3i$, $x = 1 - 3i$
(c) $x = 1$, $x = - 1$
(d) $x = 4 + 12i$, $x = 4 - 12i$
(e) no solutions

17. Find all real solutions of the equation.

$x^4 = 16x^2$

(a) $x = 0$, $x = 4$, $x = -4$
(b) $x = 0$
(c) $x = 0$, $x = 16$, $x = -16$
(d) $x = 0$, $x = 16$
(e) none of these

18. Find all real solutions of the equation.

$$\frac{1}{x-4} - \frac{25}{x^2} = 0$$

(a) $x = 0$, $x = 20$ (b) $x = 5$, $x = 20$ (c) $x = 0$, $x = -25$ (d) $x = 20$, $x = 80$ (e) none of these

19. Find all real solutions of the equation.

$$\sqrt{5x+9} + 3 = x$$

(a) 0 (b) 0, 11 (c) 11 (d) 1, 0 (e) -11

20. Grain is falling from a chute onto the ground, forming a conical pile whose diameter is always three times its height. How high is the pile (to the nearest hundredth of a foot) when it contains $1200\,\text{ft}^3$ of grain?

(a) $6.99\,\text{ft}$
(b) $7.88\,\text{ft}$
(c) $6.28\,\text{ft}$
(d) $7.5\,\text{ft}$
(e) none of these

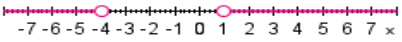
21. Solve the inequality.

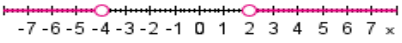
$-4 \le 2 - 3x \le 14$

(a) (-4, 2) (b) [-4, 2] (c) [-2, 4) (d) [-4, 2) (e) [-2, 4]

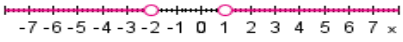
22. Solve the nonlinear inequality.

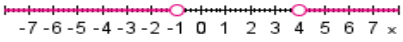
$x^2 + 3x > 4$

(a) $(-\infty, -4) \cup (1, \infty)$; 

(b) $(-\infty, -4) \cup (2, \infty)$; 

(c) $(-\infty, -5) \cup (1, \infty)$; 

(d) $(-\infty, -2) \cup (1, \infty)$; 

(e) $(-\infty, -1) \cup (4, \infty)$; 

23. In the vicinity of a bonfire the temperature T in $^\circ C$ at a distance of x meters from the center of the fire was given by $T = \dfrac{800,000}{x^2 + 400}$. At what range of distances from the fire's center was the temperature less than $400\,^\circ C$?

(a) $x \le 20$ m (b) $x \le 40$ m (c) $x \ge 1$ m (d) $x \ge 40$ m (e) none of these

24. Solve the equation.

$|x + 11| = |2x + 5|$

(a) $x = 8$ and $x = -18/5$
(b) $x = 3$ and $x = -13/4$
(c) $x = 6$ and $x = -16/3$
(d) $x = \pm 6$
(e) $x = 6$

25. Solve the inequality.

$|7x - 2| < 4$

(a) $\left[-\frac{2}{7}, \frac{6}{7}\right]$ (b) $\left(-\frac{2}{7}, \frac{6}{7}\right)$ (c) $\left(-\infty, -\frac{2}{7}\right)$ (d) $\left(-\infty, -\frac{2}{7}\right) \cup \left(\frac{6}{7}, \infty\right)$ (e) $\varnothing$

ANSWER KEY

Stewart/Redlin/Watson - Algebra and Trigonometry 4e Chapter 1 Form C

1. b
2. b
3. d
4. e
5. c
6. e
7. e
8. d
9. b
10. c
11. d
12. c
13. a
14. a
15. d
16. b
17. a
18. b
19. c
20. e
21. b
22. a
23. d
24. c
25. b

1. Evaluate the expression i^{43} and write the result in the form $a + bi$.

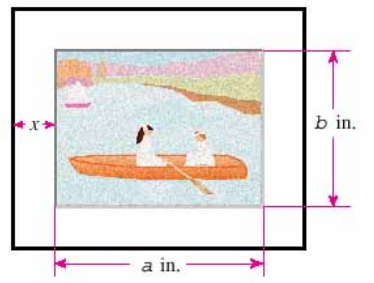
(a) -1
(b) 1
(c) i
(d) $-i$
(e) none of these

2. Solve the inequality.

$-4 \le 2 - 3x \le 14$

(a) (-4, 2) (b) [-4, 2] (c) [-2, 4) (d) [-4, 2) (e) [-2, 4]

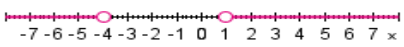
3. Caitlin paints with watercolors on a sheet of paper 28 inches wide by 16 inches high. She then places this sheet on a mat so that a uniformly wide strip of the mat shows all around the picture. The perimeter of the mat is 112 inches. How wide is the strip of the mat showing around the picture?

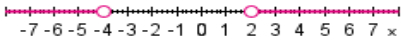


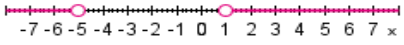
(a) 8 inches (b) 4 inches (c) 6 inches (d) 2 inches (e) 3 inches

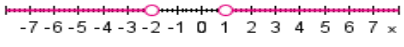
4. Solve the nonlinear inequality.

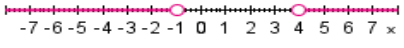
$x^2 + 3x > 4$

(a) $(-\infty, -4) \cup (1, \infty)$; 

(b) $(-\infty, -4) \cup (2, \infty)$; 

(c) $(-\infty, -5) \cup (1, \infty)$; 

(d) $(-\infty, -2) \cup (1, \infty)$; 

(e) $(-\infty, -1) \cup (4, \infty)$; 

5. Find all solutions of the equation $x^2 - 2x + 10 = 0$ and express them in the form $a + bi$.

(a) $x = 3 + 2i$, $x = 3 - 2i$
(b) $x = 1 + 3i$, $x = 1 - 3i$
(c) $x = 1$, $x = -1$
(d) $x = 4 + 12i$, $x = 4 - 12i$
(e) no solutions

6. Find all real solutions of the equation.

$\sqrt{5x+9}+3=x$

(a) 0 (b) 0, 11 (c) 11 (d) 1, 0 (e) -11

7. Solve the equation.

$$\frac{10}{x-12}+\frac{9}{x+12}=\frac{126}{x^2-144}$$

(a) - 12 (b) 12 (c) 144 (d) 6 (e) 10

8. Use the discriminant to determine the number of real solutions of the equation.

$x^2 - 5.79x + 2.37 = 0$

(a) no real solutions
(b) exactly one real solution
(c) two real solutions
(d) more than two real solutions
(e) none of these

9. Evaluate the expression $(4 + 7i)(11 - 4i)$ and write the result in the form $a + bi$.

(a) $72 + 61i$
(b) $44 + 77i$
(c) $61 + 72i$
(d) $-61 - 72i$
(e) none of these

10. Solve the equation.

$3(x + 11) + 1 = - 3(x + 5) + 7$

(a) 3 (b) - 7 (c) 10 (d) 7 (e) - 18

11. What quantity of a 50% acid solution must be mixed with a 20% solution to produce 300 mL of a 40% solution?

(a) 100 mL
(b) 180 mL
(c) 120 mL
(d) 240 mL
(e) 200 mL

12. Solve the inequality.

$|7x-2|<4$

(a) $\left[-\frac{2}{7},\frac{6}{7}\right]$ (b) $\left(-\frac{2}{7},\frac{6}{7}\right)$ (c) $\left(-\infty,-\frac{2}{7}\right)$ (d) $\left(-\infty,-\frac{2}{7}\right)\cup\left(\frac{6}{7},\infty\right)$ (e) $\varnothing$

13. Solve the equation by completing the square.

$$x^2 + 4x - \frac{9}{4} = 0$$

(a) $x = 9/2,\ x = 2$
(b) $x = -3/2,\ x = 1/2$
(c) $x = -3/2,\ x = 2$
(d) $x = -9/2,\ x = 1/2$
(e) none of these

14. Find all real solutions of the equation.

$$\frac{1}{x-4} - \frac{25}{x^2} = 0$$

(a) $x = 0, x = 20$ (b) $x = 5, x = 20$ (c) $x = 0, x = -25$ (d) $x = 20, x = 80$ (e) none of these

15. Solve the inequality.

$$\left|\frac{x+5}{2}\right| \geq 5$$

(a) $[-15, 5]$ (b) $[15, \infty)$ (c) $(-\infty, -15] \cup [5, \infty)$ (d) $(-\infty, -15) \cup (5, \infty)$ (e) $\varnothing$

16. Find all real solutions of the equation.

$x^4 = 16x^2$

(a) $x = 0, x = 4, x = -4$
(b) $x = 0$
(c) $x = 0, x = 16, x = -16$
(d) $x = 0, x = 16$
(e) none of these

17. A jeweler has three small solid spheres made of gold, of radius 1 mm, 2 mm, and 3 mm. He decides to melt these down and make just one sphere out of them. What will the radius of this larger sphere be? Round the answer to one decimal place.

(a) 4.5 mm (b) 3.5 mm (c) 5.0 mm (d) 6.0 mm (e) none of these

18. The average daily food consumption F of a herbivorous mammal with body weight x, where both F and x are measured in pounds, is given approximately by the equation $F = 0.4x^{3/4}$. Find the weight x of an elephant that consumes 400 lb of food per day.

(a) 15,000 lb
(b) 20,000 lb
(c) 10,000 lb
(d) 5,000 lb
(e) none of these

19. Solve the equation.

$|x+11| = |2x+5|$

(a) $x = 8$ and $x = -\frac{18}{5}$
(b) $x = 3$ and $x = -\frac{13}{4}$
(c) $x = 6$ and $x = -\frac{16}{3}$
(d) $x = \pm 6$
(e) $x = 6$

20. Using calculus, it can be shown that if a ball is thrown upward with an initial velocity of 16 ft/s from the top of a building 256 ft high, then its height *h* above the ground *t* seconds later will be $h = 256 + 16t - 16t^2$. During what time interval will the ball be at least 64 ft above the ground?

(a) $2 \le t \le 5$ sec (b) $3 \le t \le 4$ sec (c) $0 \le t \le 4$ sec (d) $t \ge 4$ sec (e) $t \ge 5$ sec

21. Find all real solutions of the equation.

$x^2 - \sqrt{29}x + 1 = 0$

(a) $x = 12,\ x = -17/2$
(b) $x = \sqrt{29}/2,\ x = \sqrt{17}/2$
(c) $x = \sqrt{19}/2,\ x = -\sqrt{17}/2$
(d) $x = \frac{\sqrt{29}-5}{2},\ x = \frac{\sqrt{29}+5}{2}$
(e) none of these

22. Determine which of the given choices is a solution of the equation.

$2 - 5x = 8 + x$

(a) 1
(b) -1
(c) 0
(d) 2
(e) none of these

23. Solve the equation by factoring.

$4w = 3 - 4w^2$

(a) $w = -3/2,\ w = 2$
(b) $w = -3/4,\ w = 1/2$
(c) $w = 1/4,\ w = -1/2$
(d) $w = -3/2,\ w = 1/2$
(e) none of these

24. Solve the equation for h .

$A = 2\pi rh + 2\pi r^2$

(a) $h = \dfrac{A - r^2}{r}$ (b) $h = \dfrac{A - \pi r^2}{\pi r}$ (c) $h = \dfrac{A - 2\pi r}{2\pi}$ (d) $h = A - r$ (e) none of these

25. Evaluate the expression $\dfrac{41}{4 - 5i}$ and write the result in the form $a + bi$.

(a) $4 + 5i$
(b) $4 - 5i$
(c) $-5 - 4i$
(d) $5 + 4i$
(e) none of these

ANSWER KEY

Stewart/Redlin/Watson - Algebra and Trigonometry 4e Chapter 1 Form D

1. d
2. b
3. e
4. a
5. b
6. c
7. d
8. c
9. a
10. b
11. e
12. b
13. d
14. b
15. c
16. a
17. e
18. c
19. c
20. c
21. d
22. b
23. d
24. e
25. a

1. Determine whether the given value is a solution of the equation.

$\frac{1}{x} - \frac{1}{x-4} = 1$, $x = -2$

2. Solve the equation.

$3(x + 11) + 1 = -3(x + 5) + 7$

(a) - 18 (b) 7 (c) 3 (d) 10 (e) - 7

3. Solve the equation.

$$\frac{7}{x-8} + \frac{7}{x+8} = \frac{154}{x^2 - 64}$$

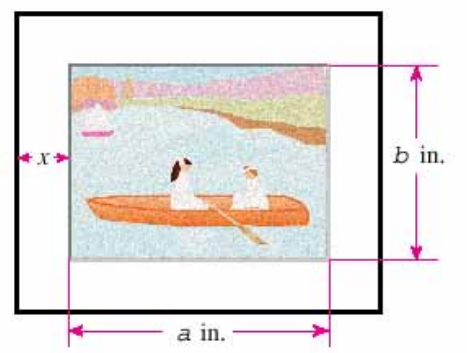
4. Solve the equation for h .

$A = 2\pi rh + 2\pi r^2$

(a) $h = \frac{A - r^2}{r}$ (b) $h = \frac{A - \pi r^2}{\pi r}$ (c) $h = \frac{A - 2\pi r}{2\pi}$ (d) $h = A - r$ (e) none of these

5. The average daily food consumption F of a herbivorous mammal with body weight x, where both F and x are measured in pounds, is given approximately by the equation $F = 0.2x^{3/4}$. Find the weight x of an elephant that consumes 200 lb of food per day.

6. Josiah paints with watercolors on a sheet of paper 28 inches wide by 16 inches high. He then places this sheet on a mat so that a uniformly wide strip of the mat shows all around the picture. The perimeter of the mat is 112 inches. How wide is the strip of the mat showing around the picture?



(a) 2 inches
(b) 8 inches
(c) 3 inches
(d) 6 inches
(e) 4 inches

7. What quantity of a 40% acid solution must be mixed with a 10% solution to produce 300 mL of a 30% solution?

8. Solve the equation by factoring.

$4w = 3 - 4w^2$

(a) $w = -3/2,\ w = 2$
(b) $w = -3/4,\ w = 1/2$
(c) $w = 1/4,\ w = -1/2$
(d) $w = -3/2,\ w = 1/2$
(e) none of these

9. Solve the equation by completing the square.

$x^2 + 4x - \frac{9}{4} = 0$

(a) $x = 9/2,\ x = 2$
(b) $x = -3/2,\ x = 1/2$
(c) $x = -3/2,\ x = 2$
(d) $x = -9/2,\ x = 1/2$
(e) none of these

10. Find all real solutions of the equation.

$x^2 - \sqrt{29}x + 1 = 0$

(a) $x = 12,\ x = -17/2$
(b) $x = \sqrt{29}/2,\ x = \sqrt{17}/2$
(c) $x = \sqrt{19}/2,\ x = -\sqrt{17}/2$
(d) $x = \frac{\sqrt{29} - 5}{2},\ x = \frac{\sqrt{29} + 5}{2}$
(e) none of these

11. Use the discriminant to determine the number of real solutions of the equation.

$x^2 - 5.66x + 2.52 = 0$

12. Evaluate the expression $(4 + 7i)(11 - 4i)$ and write the result in the form $a + bi$.

(a) $61 + 72i$
(b) $44 + 77i$
(c) $72 + 61i$
(d) $-61 - 72i$
(e) none of these

13. Evaluate the expression $\frac{90}{9 - 3i}$ and write the result in the form $a + bi$.

14. Evaluate the expression i^{43} and write the result in the form $a + bi$.

(a) $-(-i)$ (b) $-i$ (c) 1 (d) -1 (e) none of these

15. Find all solutions of the equation $x^2 - 2x + 5 = 0$ and express them in the form $a + bi$.

16. Find all real solutions of the equation

$x^4 = 16x^2$

(a) $x = 0$
(b) $x = 0, x = 4, x = -4$
(c) $x = 0, x = 16$
(d) $x = 0, x = 16, x = -16$
(e) none of these

17. Find all real solutions of the equation

$$\frac{1}{x-7} - \frac{64}{x^2} = 0$$

18. Find all real solutions of the equation

$$\sqrt{5x+9} + 3 = x$$

(a) -11 (b) 0, 11 (c) 11 (d) 1, 0 (e) 0

19. A jeweler has three small solid spheres made of gold, of radius 1 mm, 2 mm, and 3 mm. He decides to melt these down and make just one sphere out of them. What will the radius of this larger sphere be? Round the answer to one decimal place.

20. Solve the inequality. Express the solution using interval notation.

$-4 \le 2 - 3x \le 14$

(a) [-4, 2) (b) (-4, 2) (c) [-2, 4] (d) [-2, 4) (e) [-4, 2]

21. A car rental company offers two plans for renting a car.

Plan A: \$40 per day and \$0.20 per mile.
Plan B: \$60 per day with free unlimited mileage.

For what range of miles will plan B save you money?

22. Solve the equation.

$|5 - 4x| + 8 = 16$

(a) $x = -0.75$
(b) $x = \pm 0.75$
(c) $x = 2.25$ and $x = 6.25$
(d) $x = -0.75$ and $x = 3.25$
(e) $x = 1.25$ and $x = 5.25$

23. Solve the equation.

$|x + 19| = |4x + 7|$

24. Solve the inequality.

$|7x-2|<4$

(a) $\left[-\frac{2}{7},\frac{6}{7}\right]$

(b) $\left(-\frac{2}{7},\frac{6}{7}\right)$

(c) $\left(-\infty,-\frac{2}{7}\right)$

(d) $\left(-\infty,-\frac{2}{7}\right)\cup\left(\frac{6}{7},\infty\right)$

(e) $\varnothing$

25. In the vicinity of a bonfire the temperature T in $^\circ C$ at a distance of x meters from the center of the fire was given by $T=\frac{800,000}{x^2+400}$. At what range of distances from the fire's center was the temperature less than $400^\circ C$?

ANSWER KEY

Stewart/Redlin/Watson - Algebra and Trigonometry 4e Chapter 1 Form E

1. no

2. e

3. 11

4. e

5. 10,000 lb

6. c

7. 200 mL

8. d

9. d

10. d

11. 2

12. c

13. $9+3i$

14. b

15. $1+2i,\ 1-2i$

16. b

17. 8, 56

18. c

19. 3.3 mm

20. e

21. $m > 100$

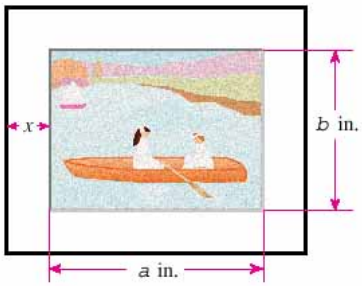
22. d

23. $4,\ -\frac{26}{5}$

24. b

25. $x \geq 40$ m

1. Joshua paints with watercolors on a sheet of paper 28 inches wide by 16 inches high. He then places this sheet on a mat so that a uniformly wide strip of the mat shows all around the picture. The perimeter of the mat is 112 inches. How wide is the strip of the mat showing around the picture?



(a) 2 inches (b) 8 inches (c) 3 inches (d) 6 inches (e) 4 inches

2. Solve the equation.

$|x + 19| = |4x + 7|$

3. A car rental company offers two plans for renting a car.

Plan A: \$40 per day and \$0.20 per mile.

Plan B: \$60 per day with free unlimited mileage.

For what range of miles will plan B save you money?

4. A pasture is four times as long as it is wide. Its area is $230,400\,\text{ft}^2$. How long is the pasture?

5. Evaluate the expression $\dfrac{90}{9-3i}$ and write the result in the form $a + bi$.

6. Use the discriminant to determine the number of real solutions of the equation.

$x^2 - 5.66x + 2.52 = 0$

7. Evaluate the expression $(4 + 7i)(11 - 4i)$ and write the result in the form $a + bi$.

(a) $61 + 72i$
(b) $44 + 77i$
(c) $72 + 61i$
(d) $-61 - 72i$
(e) none of these

8. A jeweler has three small solid spheres made of gold, of radius 1 mm, 2 mm, and 3 mm. He decides to melt these down and make just one sphere out of them. What will the radius of this larger sphere be? Round the answer to one decimal place.

9. What quantity of a 40% acid solution must be mixed with a 10% solution to produce 300 mL of a 30% solution?

10. Find all real solutions of the equation.

$x^2 - \sqrt{29}x + 1 = 0$

11. Solve the equation.

$5x - 3 = 6x + 4$

12. Find all real solutions of the equation

$$\frac{1}{x-7} - \frac{64}{x^2} = 0$$

13. Solve the equation.

$3(x + 11) + 1 = -3(x + 5) + 7$

(a) - 18 (b) 7 (c) 3 (d) 10 (e) - 7

14. Solve the equation by completing the square.

$$x^2 + 4x - \frac{9}{4} = 0$$

(a) $x = 9/2,\ x = 2$
(b) $x = -3/2,\ x = 1/2$
(c) $x = -3/2,\ x = 2$
(d) $x = -9/2,\ x = 1/2$
(e) none of these

15. Solve the equation by factoring.

$4w = 3 - 4w^2$

(a) $w = -3/2,\ w = 2$
(b) $w = -3/4,\ w = 1/2$
(c) $w = 1/4,\ w = -1/2$
(d) $w = 3/2,\ w = 1/2$
(e) none of these

16. Solve the equation.

$$\frac{7}{x-8} + \frac{7}{x+8} = \frac{154}{x^2 - 64}$$

17. Evaluate the expression i^{43} and write the result in the form $a + bi$.

(a) $-(-i)$
(b) $-i$
(c) 1
(d) -1
(e) none of these

18. Solve the inequality.

$|7x-2|<4$

(a) $\left[-\frac{2}{7},\frac{6}{7}\right]$ (b) $\left(-\frac{2}{7},\frac{6}{7}\right)$ (c) $\left(-\infty,-\frac{2}{7}\right)$ (d) $\left(-\infty,-\frac{2}{7}\right)\cup\left(\frac{6}{7},\infty\right)$ (e) $\varnothing$

19. Solve the inequality. Express the solution using interval notation.

$-4 \le 2-3x \le 14$

(a) [-4, 2) (b) (-4, 2) (c) [-2, 4] (d) [-2, 4) (e) [-4, 2]

20. The average daily food consumption F of a herbivorous mammal with body weight x, where both F and x are measured in pounds, is given approximately by the equation $F = 0.2x^{3/4}$. Find the weight x of an elephant that consumes 200 lb of food per day.

21. Find all solutions of the equation $x^2 - 2x + 5 = 0$ and express them in the form $a + bi$.

22. Solve the inequality.

$3 - x \ge 3x + 15$

23. Solve the equation for h.

$A = 2\pi rh + 2\pi r^2$

(a) $h = \frac{A-r^2}{r}$ (b) $h = \frac{A-\pi r^2}{\pi r}$ (c) $h = \frac{A-2\pi r}{2\pi}$ (d) $h = A - r$ (e) none of these

24. Find all real solutions of the equation

$\sqrt{5x+9}+3 = x$

(a) -11 (b) 0, 11 (c) 11 (d) 1, 0 (e) 0

25. Find all real solutions of the equation

$x^4 = 16x^2$

(a) $x = 0$
(b) $x = 0$, $x = 4$, $x = -4$
(c) $x = 0$, $x = 16$
(d) $x = 0$, $x = 16$, $x = -16$
(e) none of these

ANSWER KEY

Stewart/Redlin/Watson - Algebra and Trigonometry 4e Chapter 1 Form F

1. c

2. $4, \ -26/5$

3. $\text{miles} > 100$

4. 960 ft

5. $9+3i$

6. 2

7. c

8. 3.3 mm

9. 200 mL

10. $x = \dfrac{\sqrt{29}-5}{2}, \ x = \dfrac{\sqrt{29}+5}{2}$

11. -7

12. 8, 56

13. e

14. d

15. e

16. 11

17. b

18. b

19. e

20. 10,000 lb

21. $1+2i, \ 1-2i$

22. $(-\infty, -3]$

23. e

24. c

25. b