College Algebra

Third Edition

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NAME_____

CLASS_____SCORE_____GRADE_____

Solve. Find exact solutions.

ANSWERS

1. $-3x + 2 = 15$

2. $9(y - 2) = 8y + 14$

3. $(2x - 5)(x + 8) = 0$

4. $4x^2 - 64 = 0$

5. $y^2 + 25 = 0$

6. $x^2 + 5x - 24 = 0$

7. $3x^2 - 2x - 6 = 0$

8. $5m^2 + 2m + 2 = 0$

9. $x - 5\sqrt{x} - 24 = 0$

10. $\dfrac{3}{x + 5} - \dfrac{11}{3x - 1} = -1$

11. $\sqrt{6 + 2n} - 2 = 2$

12. $\sqrt{4x - 11} + 2 = \sqrt{6x - 5}$

13. $|5x + 4| = 13$

Solve and write interval notation for the solution set.

14. $-1 < 3x - 5 \le 8$

15. $3x - 2 \le -3 \ or \ 4x + 1 \ge 2$

16. $|x + 5| < 8$

17. $|x + 6| \ge 10$

18. Solve $P = 2w + 2l$ for w.

19. Solve $\dfrac{1}{a} + \dfrac{1}{b} = 8$ for b.

20. Solve $x^2 - 3x = 12$ by completing the square. Find exact solutions. Show your work.

21. A boat travels 10 mi upstream and 10 mi downstream. The total time for both parts of the trip is $5\dfrac{1}{3}$ hr. The speed of the stream is 1 mph. What is the speed of the boat in still water?

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ANSWERS	22. A parking lot has a perimeter of 500 ft. The width is 20 ft less than the length. Find the dimensions.
22._____	
	Express in terms of i.
23._____	23. $\sqrt{-13}$
24._____	24. $-\sqrt{-121}$
	Simplify.
25._____	25. $(5-3i)-(6+2i)$
26._____	26. $(7+6i)(4-3i)$
27._____	27. $\dfrac{3-2i}{7+i}$
	28. i^{18}
28._____	Find the zero(s) of each function.
29._____	29. $f(x)=3x+1$
	30. $f(x)=3x^2+25x-18$
30._____	31. $f(x)=x^2+6x-15$
31._____	32. For the graph of the function $f(x)=x^2-6x+4$,

22. A parking lot has a perimeter of 500 ft. The width is 20 ft less than the length. Find the dimensions.

Express in terms of i.

23. $\sqrt{-13}$ 24. $-\sqrt{-121}$

Simplify.

25. $(5-3i)-(6+2i)$ 26. $(7+6i)(4-3i)$

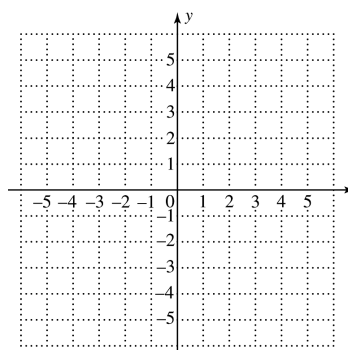27. $\dfrac{3-2i}{7+i}$ 28. i^{18}

Find the zero(s) of each function.

29. $f(x)=3x+1$ 30. $f(x)=3x^2+25x-18$

31. $f(x)=x^2+6x-15$

32. For the graph of the function $f(x)=x^2-6x+4$,
   a) find the vertex;
   b) find the line of symmetry;
   c) state whether there is a maximum or minimum value and find that value;
   d) find the range;
   e) graph the function.

32. a)_____
    b)_____
    c)_____
    d)_____
    e) See graph.

33._____

34._____

33. A homeowner wants to fence a rectangular garden using 60 ft of fencing. An existing stone wall will be used as one side of the rectangle. Find the dimensions for which the area is a maximum.

34. Find a such that $f(x)=ax^2+5x+6$ has a minimum value of $7\dfrac{1}{24}$.

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CLASS_____SCORE_____GRADE_____

Solve. Find exact solutions.

1. $-8x + 3 = -24$

2. $3(y + 4) = 8y - 13$

3. $(4x + 5)(x - 9) = 0$

4. $8x^2 - 24 = 0$

5. $y^2 + 49 = 0$

6. $x^2 - 8x + 12 = 0$

7. $4x^2 - 9x + 2 = 0$

8. $x^2 - x + 5 = 0$

9. $x + 5\sqrt{x} - 24 = 0$

10. $\dfrac{70}{x - 6} + \dfrac{42}{2x + 1} = -13$

11. $\sqrt{8x + 28} - 6 = -4$

12. $\sqrt{3x + 7} - \sqrt{10 - x} = 3$

13. $|3x + 2| = 11$

Solve and write interval notation for the solution set.

14. $-4 \le 3x + 1 < 7$

15. $5x + 3 < -4 \text{ or } 3x + 5 \ge 6$

16. $|x - 3| < 10$

17. $|x - 4| \ge 2$

18. Solve $A = P + Prt$ for t.

19. Solve $\dfrac{3}{m} - 2n = 6$ for m.

20. Solve $x^2 - 4x = 2$ by completing the square. Find exact solutions. Show your work.

21. The speed of the current in a river is 2 mph. Jay travels 20 mi upstream and then 20 mi downstream in a total time of $5\frac{1}{3}$ hr. Find the speed of his boat.

ANSWERS

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NAME_____

ANSWERS

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32. a) _____
    b) _____
    c) _____
    d) _____
    e) See graph.

33. _____

34. _____

22. The hypotenuse of a right triangle is 65 ft. One leg is 35 ft longer than the other. What are the lengths of the legs?

Express in terms of i.

23. $\sqrt{-6}$

24. $-\sqrt{-100}$

Simplify.

25. $(4-2i)-(8+3i)$

26. $(4-i)(6+i)$

27. $\dfrac{3+6i}{5+i}$
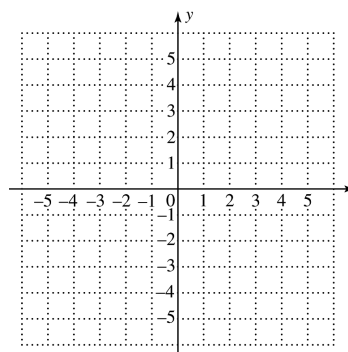
28. i^{34}

Find the zero(s) of each function.

29. $f(x)=6x+3$

30. $f(x)=6x^2+13x-15$

31. $f(x)=5x^2-3x-3$

32. For the graph of the function $f(x)=2x^2-12x+20$,
    a) find the vertex;
    b) find the line of symmetry;
    c) state whether there is a maximum or minimum value and find that value;
    d) find the range;
    e) graph the function.

33. Doreen's Catering charges $150 for set up plus $12 per person for parties under 100 people. Jackson's Catering charges $18 per person for parties under 100 people. For what size party is Jackson's a better deal? Assume that the party will be under 100 people.

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34. Solve $(x-2)^{5/4}=32$.

CHAPTER 2   NAME_____

TEST FORM C   CLASS_____SCORE_____GRADE_____

Solve. Find exact solutions.

1. $4x - 6 = 8$ 2. $3y + 8 = 2(y - 12)$

3. $(4x - 3)(2x + 1) = 0$ 4. $6x^2 - 24 = 0$

5. $x^2 + 16 = 0$ 6. $x^2 - 2x - 8 = 0$

7. $5x^2 + 17x + 6 = 0$ 8. $x^2 - 4x + 6 = 0$

9. $x - 10\sqrt{x} + 24 = 0$ 10. $\dfrac{12}{x-2} + \dfrac{26}{2x+1} = 5$

11. $\sqrt{3x + 4} + 5 = 9$ 12. $\sqrt{x + 6} + 1 = \sqrt{2x - 11}$

13. $|8m - 3| = 7$

Solve and write interval notation for the solution set.

14. $-6 \leq 2x - 3 < 5$ 15. $2x \geq 9$ or $3x - 5 \leq -2$

16. $|x - 6| < 3$ 17. $|x + 2| \geq 6$

18. Solve $A = \dfrac{1}{2}bh$ for h.   19. Solve $A = 2.5\sqrt{n}$ for n.

20. Solve $x^2 - 6x = 8$ by completing the square. Find exact solutions. Show your work.

21. It cost $27.95 per day plus $0.15 per mile to rent a car. How many miles was a car driven that was rented for one day and had a rental bill of $45.95?

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ANSWERS

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32. a) _____
   b) _____
   c) _____
   d) _____
   e)   See graph.

33. _____

34. _____

22. The edges of a 20 ft by 30 ft garden are to be torn up to install a walking path of uniform width around its perimeter. The area of the new garden is three fourths of the old area. How wide is the walking path?

Express in terms of i.

23. $\sqrt{-11}$ 24. $\sqrt{-12}$

Simplify.

25. $(3-2i)-(6+5i)$ 26. $(3+2i)(4-i)$

27. $\dfrac{4-3i}{5+i}$ 28. i^{23}

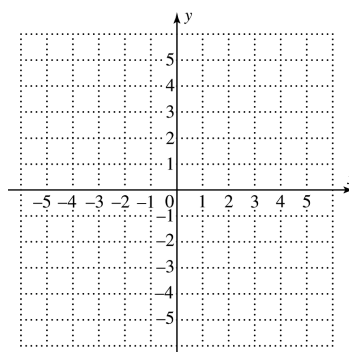Find the zero(s) of each function.

29. $f(x)=-2x+4$ 30. $f(x)=4x^2+11x+6$

31. $f(x)=2x^2+x-5$

32. For the graph of the function $f(x)=-x^2+6x-8$,
   a) find the vertex;
   b) find the line of symmetry;
   c) state whether there is a maximum or minimum value and find that value;
   d) find the range;
   e) graph the function.

33. The formula $F=\dfrac{9}{5}C+32$ can be used to convert Celsius temperatures to Fahrenheit temperatures. For what Celsius temperatures is the Fahrenheit temperature below $60°$ F?

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34. Solve $\sqrt{\sqrt{\sqrt{x}}}=3$.

Solve. Find exact solutions.

1. $5x - 3 = 6$

2. $3(y + 4) = 6y - 9$

3. $(2x - 5)(5x + 3) = 0$

4. $-4x^2 + 36 = 0$

5. $x^2 + 36 = 0$

6. $x^2 - 12x + 35 = 0$

7. $x^2 - 6x + 3 = 0$

8. $x^2 - 3x + 7 = 0$

9. $x + 7\sqrt{x} - 18 = 0$

10. $\dfrac{14}{x - 3} + \dfrac{10}{x + 6} = 3$

11. $\sqrt{x + 6} + 8 = 11$

12. $\sqrt{x + 7} + 5 = 2\sqrt{6x + 4}$

13. $|5 - x| = 8$

Solve and write interval notation for the solution set.

14. $-3 \le 5x + 2 < 10$

15. $4x + 6 \le 8 \text{ or } 3x > 2$

16. $|x + 2| \ge 4$

17. $|x - 5| < 14$

18. Solve $PV = nrt$ for r.

19. Solve $T = \sqrt{12.5k}$ for k.

20. Solve $x^2 + 4x = 9$ by completing the square. Find exact solutions. Show your work.

21. Rosie's Books prices its books by raising the wholesale price 40% and adding 50¢. What is the wholesale price on a book that sells for $39.95? Round to the nearest cent.

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NAME_____

ANSWERS

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31. _____

32. a) _____
    b) _____
    c) _____
    d) _____
    e) See graph.

33. _____

34. _____

22. Two trains leave the same city at the same time at right angles. One train travels at a speed of 75 km/h. In 2 hr the trains are 250 km apart. How fast is the other train traveling?

Express in terms of i.

23. $\sqrt{-25}$ 24. $-\sqrt{-49}$

Simplify.

25. $(8-6i)-(-5+4i)$ 26. $(4-3i)(4+3i)$

27. $\dfrac{2-i}{3+i}$ 28. i^{15}

Find the zero(s) of each function.
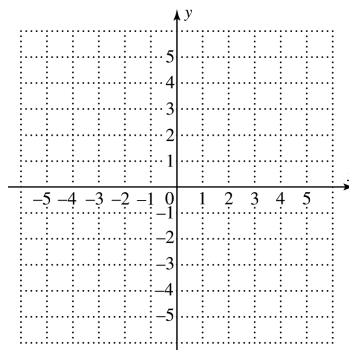
29. $f(x)=4x-5$ 30. $f(x)=2x^2-13x+6$

31. $f(x)=x^2-8x+5$

32. For the graph of the function $f(x)=-x^2-4x$,
    a) find the vertex;
    b) find the line of symmetry;
    c) state whether there is a maximum or minimum value and find that value;
    d) find the range;
    e) graph the function.

33. The sum of the base and the height of a triangle is 72 in. Find the base for which the area is a maximum.

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34. Solve $(x-2)^2-40=3(x-2)$.

ANSWERS

1. Solve: $4(y-2)=10y+5$.

   a) $-\dfrac{6}{13}$ b) $-\dfrac{13}{6}$ c) $-\dfrac{7}{6}$ d) $\dfrac{1}{2}$

   1. _____

2. Solve: $15x^2-7x-4=0$.

   a) $-\dfrac{1}{3},\dfrac{5}{4}$ b) $-\dfrac{4}{5},\dfrac{1}{3}$ c) $\dfrac{5}{4},-3$ d) $\dfrac{4}{5},-\dfrac{1}{3}$

   2. _____

3. Solve: $2m^2-m+9=0$.

   a) $\dfrac{1\pm\sqrt{73}}{4}$ b) $\dfrac{1\pm\sqrt{35}i}{4}$ c) $\dfrac{1\pm\sqrt{71}i}{4}$ d) $\dfrac{1\pm\sqrt{71}i}{4}$

   3. _____

4. Solve: $x+3\sqrt{x}-18=0$.

   a) 3   b) 81   c) $\pm\sqrt{3}$ d) 9

   4. _____

5. Solve: $y^2+1=0$.

   a) $-i,i$ b) $-i,1$ c) i d) $-i$

   5. _____

6. Find one of the solutions of $\dfrac{5}{2x+6}+\dfrac{46}{7x}=2$.

   a) $\dfrac{1}{4}$ b) $\dfrac{69}{28}$ c) 4   d) 2

   6. _____

7. Solve: $\sqrt{5x+14}+3=5$.

   a) 10   b) –2   c) $\dfrac{144}{25}$ d) $\dfrac{18}{5}$

   7. _____

8. Solve: $|5m-6|=20$.

   a) $-\dfrac{14}{5},\dfrac{26}{5}$ b) $-\dfrac{26}{5},\dfrac{26}{5}$ c) –70, 130   d) $\dfrac{26}{5}$

   8. _____

9. Solve: $|x+6|\geq 5$.

   a) $(-\infty,-11]\cup[-1,\infty)$ b) $[-11,-1]$
   c) $(-\infty,1]\cup[11,\infty)$ d) $[1,11]$

   9. _____

10. Solve: $-10<3x+3\leq 4$.

   a) $\left[-\dfrac{13}{3},\dfrac{1}{3}\right)$ b) $\left[-\dfrac{1}{3},\dfrac{13}{3}\right)$ c) $\left(-\dfrac{13}{3},\dfrac{1}{3}\right]$ d) $\left(-\dfrac{7}{3},\dfrac{1}{3}\right]$

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11. Solve $P = Irt$ for t.

  a) $t = P - Ir$ b) $t = PIr$ c) $t = \dfrac{Ir}{P}$ d) $t = \dfrac{P}{Ir}$

12. Find the zero of $f(x) = 3x - 4$.

  a) $-\dfrac{4}{3}$ b) $\dfrac{4}{3}$ c) $-\dfrac{3}{4}$ d) $\dfrac{3}{4}$

13. Find the zeros of $f(x) = 4x^2 - 17x - 15$.

  a) $-\dfrac{4}{3}, 5$ b) $-5, \dfrac{3}{4}$ c) $-5, \dfrac{4}{3}$ d) $-\dfrac{3}{4}, 5$

14. Solve $x^2 - 4x = 6$ by completing the square.

  a) $2 \pm \sqrt{10}$ b) $2 \pm 2\sqrt{2}i$ c) $\dfrac{4 \pm \sqrt{22}}{2}$ d) $2 \pm 2\sqrt{10}$

15. Express $\sqrt{-6}$ in terms of i.

  a) $\sqrt{6}i$ b) $6i$ c) $-\sqrt{6}i$ d) $-\sqrt{6}$

16. Simplify: $(5 - 2i)(8 + i)$.

  a) $38 - 11i$ b) $42 - 11i$ c) $40 + 2i$ d) 42

17. Simplify: i^{12}.

  a) i b) -1 c) $-i$ d) 1

18. For the graph of the function $f(x) = 2x^2 - 12x + 14$ find the vertex.

  a) $(3, 4)$ b) $(6, 14)$ c) $(-4, 3)$ d) $(3, -4)$

19. For the graph of the function $f(x) = 4x^2 - 8x - 1$ find the line of symmetry.

  a) $x = 1$ b) $x = 2$ c) $x = -5$ d) $x = \dfrac{1}{4}$

20. The sum of the base and the height of a triangle is 54 in. Find the base for which the area is a maximum.

  a) $b = \dfrac{27}{2}$ in. b) $b = 18$ in. c) $b = 27$ in. d) $b = 36$ in.

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21. Find b such that $f(x) = -2x^2 + bx - 30$ has a maximum value of 2 and the vertex is located in the second quadrant.

  a) -16 b) 4 c) -8 d) -4

NAME_____

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1. Solve: $2(x+6)=3x+8$.

    a) –2   b) –20   c) $-\dfrac{4}{5}$ d) 4

2. Solve: $2x^2+x-28=0$.

    a) $-4,\dfrac{2}{7}$ b) –4, 7   c) $-4,\dfrac{7}{2}$ d) $4,-\dfrac{7}{2}$

3. Solve: $x^2-6x+1=0$.

    a) $3\pm2\sqrt{2}$ b) 1, 5   c) $3\pm\sqrt{10}$ d) $3\pm\sqrt{2}$

4. Solve: $3x-7\sqrt{x}-20=0$.

    a) 4   b) $-\dfrac{5}{3},4$ c) $\dfrac{25}{9},16$ d) 16

5. Solve: $x^2+81=0$.

    a) –9, 9   b) $-9i,9i$ c) –81   d) $-81i$

6. Solve: $\dfrac{12}{3x-2}-\dfrac{5}{x+4}=1$.

    a) $\dfrac{22}{3},-3$ b) $\dfrac{58}{3}$ c) $-\dfrac{22}{3},3$ d) $-\dfrac{3}{22},3$

7. Solve: $\sqrt{5x-11}+2=5$.

    a) 4   b) 100   c) $-\dfrac{2}{5}$ d) 2

8. Solve: $|3x-4|=17$.

    a) –39, 63   b) $-\dfrac{13}{3},7$ c) $-\dfrac{13}{3}$ d) 7

9. Solve: $|15+x|>2$.

    a) $(-\infty,-17]\cup[13,\infty)$ b) $(-17, 13)$
    c) $(\infty,13)\cup(17,\infty)$ d) $(-\infty,-17)\cup(-13,\infty)$

10. Solve: $-2<2x+1\le6$.

    a) $\left[-\dfrac{3}{2},\dfrac{5}{2}\right)$ b) $(-4.3]$ c) $\left(-\dfrac{1}{2},\dfrac{7}{2}\right]$ d) $\left(-\dfrac{3}{2},\dfrac{5}{2}\right]$

11. Solve $S=\sqrt{8mn}$ for m.

    a) $m=\dfrac{S^2}{8n}$ b) $m=\dfrac{S^2}{64n^2}$ c) $m=\dfrac{\sqrt{S}}{8n}$ d) $m=\dfrac{8n}{S^2}$

ANSWERS

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ANSWERS

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12. Find the zero of $f(x) = 6 - 5x$.

   a) $-\dfrac{6}{5}$ b) $\dfrac{6}{5}$ c) $-\dfrac{5}{6}$ d) $\dfrac{5}{6}$

13. Find the zeros of $f(x) = 4x^2 - 19x - 30$.

   a) $-6, \dfrac{5}{4}$ b) $-\dfrac{4}{5}, 6$ c) $-\dfrac{5}{4}, 6$ d) $-6, \dfrac{4}{5}$

14. Solve $x^2 + 5x = 8$ by completing the square.

   a) $\dfrac{-5 \pm \sqrt{7}i}{2}$ b) $\dfrac{-5 \pm \sqrt{7}}{2}$ c) $\dfrac{-5 \pm \sqrt{22}i}{2}$ d) $\dfrac{-5 \pm \sqrt{57}}{2}$

15. Express $\sqrt{-8}$ in terms of i.

   a) $-2\sqrt{2}$ b) $2\sqrt{2}i$ c) $4\sqrt{2}i$ d) $-2\sqrt{2}i$

16. Simplify: $(4 + 3i)(5 - i)$.

   a) $23 + 11i$ b) $17 + 11i$ c) $23 - 11i$ d) $20 + 3i$

17. Simplify: i^{21}.

   a) i b) -1 c) $-i$ d) 1

18. For the graph of the function $f(x) = -3x^2 + 18x - 31$ find the vertex.

   a) $(3, 4)$ b) $(6, 14)$ c) $(-4, 3)$ d) $(3, -4)$

19. For the graph of the function $f(x) = x^2 - 2x + 3$ find the line of symmetry.

   a) $x = 1$ b) $x = 2$ c) $x = 3$ d) $x = \dfrac{1}{2}$

20. The Cotes have 30 feet of picket fence with which to enclose a flower garden. What dimensions should the garden have in order to maximize area?
   a) 15 ft by 15 ft   b) 7 ft by 8 ft
   c) 7.5 ft by 7.5 ft   d) 20 ft by 5 ft

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21. Find the value of a such that $f(x) = ax^2 + 16x + 38$ has a minimum value of 6.

   a) –2   b) $\dfrac{96}{19}$ c) 2   d) $-\dfrac{96}{19}$