

Chapter 8 Review

Sections labeled at the start of the related problems

8.1 Solve.

1) $x^2 + 2 = 11$

2) $(x - 5)^2 - 4 = 0$

3) $(x - 1)^2 = -16$

4) Let $f(x) = (x - 4)^2$. Find x so that $f(x) = 12$.

Complete the square. Then write the trinomial square in factored form.

5) $x^2 - 14x$

6) $x^2 + 3x$

7) $x^2 - \frac{2}{5}x$

Solve by completing the square.

8) $a^2 - 4a - 32 = 0$

9) $2x^2 + 7x + 3 = 0$

10) $x^2 + 8x = 7$

11) $x^2 + 4x + 40 = 0$

Complete the square to find the x -intercepts of the function.

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

The formula $s = 16t^2$ is used to approximate the distance s , in feet, that an object falls freely (from rest) in t seconds. Use this formula to solve the problem. (Round answer to the nearest tenth.)

13) How long would it take an object to fall freely from a bridge 915 ft above the water?

8.2 Solve using the Quadratic Formula.

14) $2x^2 + 12x = -1$

Solve using the Quadratic Formula.

15) $\frac{6}{x} + \frac{6}{x+9} = 1$

16) $x^2 - 12x + 45 = 0$

17) $5x(x + 2) + 21 = 4x(x + 5)$

Solve.

18) $x^3 - 8 = 0$

19) Let $f(x) = 2x^2 - 5x - 1$. Find x so that $f(x) = 0$.

8.3 Use the discriminant to determine whether the following equations have solutions that are: two different rational solutions; two different irrational solutions; exactly one rational solution; or two different imaginary solutions.

20) $v^2 - 8v + 3 = 0$

21) $w^2 + 5w + 8 = 0$

Write a quadratic equation having the given numbers as solutions.

22) $-5, -10$

23) $\frac{5}{3}, \frac{3}{5}$

24) $4i, -4i$

25) $6 - \sqrt{10}, 6 + \sqrt{10}$

8.4 Solve the problem.

26) Working together, Rick and Juanita can complete a job in 6 hours. It would take Rick 9 hours longer than Juanita to do the job alone. How long would it take Juanita alone?

Solve the problem.

27) Sue rowed her boat across Lake Bend and back in 3 hours. If her rate returning was 2 mph less than the rate going, and if the distance each way was 7 miles, find her rate going.

28) The distance traveled by an object moving in a straight line is given by $s = t^2 - 8t$, where s is in feet and t is the time in seconds the object has been in motion. How long (to the nearest tenth) will it take the object to move 16 feet?

Solve the formula for the indicated letter. Assume that all variables represent nonnegative numbers.

29) $v^2 = 2as$ for v

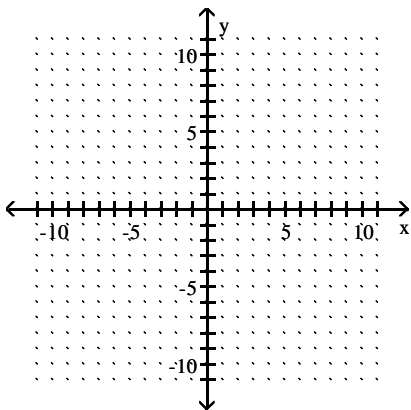
30) $rm = t^2 - mt$, for t

Answer the question. You will need to use the formula $4.9t^2 + v_0t = s$.

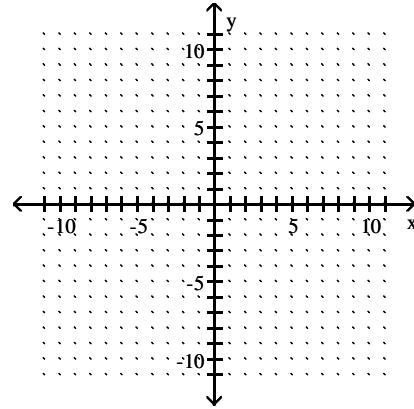
31) A ball is thrown downward at a speed of 20 meters per second from an altitude of 656 meters. Approximately how long does it take to reach the ground?

8.6 Graph.

32) $f(x) = 2x^2$



33) $f(x) = -(x - 2)^2$



Without graphing, find the vertex.

34) $f(x) = (x + 5)^2 - 1$

35) $f(x) = 2(x - 18)^2 - 9$

36) $f(x) = 5\left(x + \frac{1}{7}\right)^2 + 14$

Find the axis of symmetry of the graph of the parabola.

37) $f(x) = -\frac{19}{5}(x + 2)^2 - 2$

Without graphing, find the maximum value or minimum value.

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

39) $f(x) = 1.18(x + 1)^2 - 3$

Write the equation for the function having a graph that meets all of the specified conditions.

40) Has the same shape as the graph of $g(x) = 2x^2$ or $h(x) = -2x^2$ and has a maximum value at $(4, 7)$.

8.7 Complete the square to write the function in the form $f(x) = a(x - h)^2 + k$.

41) $f(x) = x^2 + 2x - 4$

42) $f(x) = 9x^2 + 4x + 4$

Find the vertex.

43) $f(x) = 3x^2 + 18x + 26$

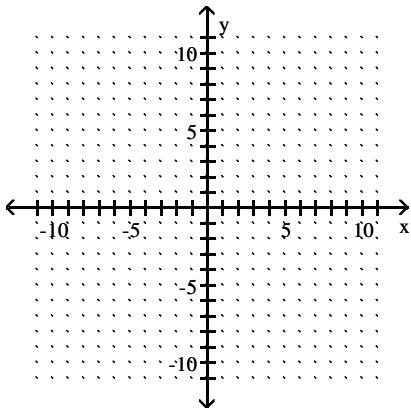
44) $f(x) = 4x^2 + 40x + 102$

Find the line of symmetry.

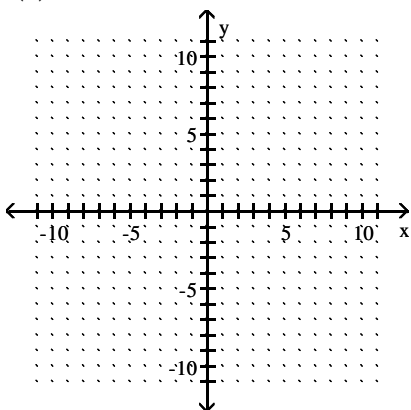
45) $f(x) = 2x^2 - 16x + 33$

Graph.

46) $f(x) = -x^2 + 2x - 4$



47) $f(x) = 4x^2 + 2x - 8$



Find the x- and y-intercepts. If no x-intercepts exist, state so.

48) $f(x) = 4x^2 + 10x + 2$

49) $f(x) = -x^2 + 19x - 90$

8.8 Solve.

50) Which of the pairs of numbers whose sum is 74 has the largest product?

Solve.

51) A gardener is fencing off a rectangular area with a fixed perimeter of 40 ft. What is the maximum area?

52) A projectile is thrown upward so that its distance above the ground after t seconds is $h = -13t^2 + 312t$. After how many seconds does it reach its maximum height?

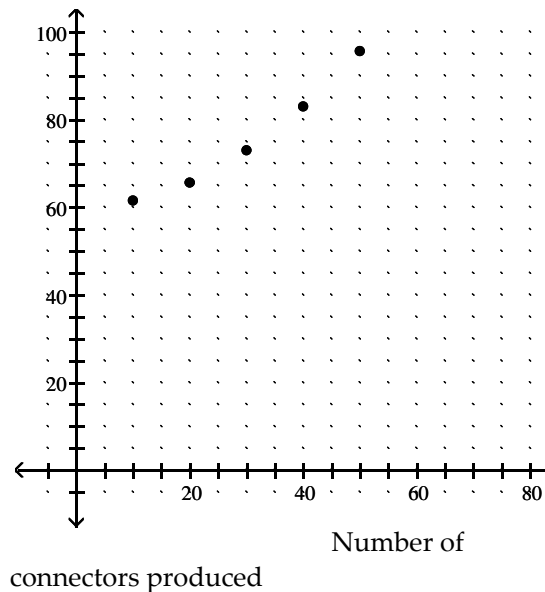
53) Bob owns a watch repair shop. He has found that the cost of operating his shop is given by $c = 4x^2 - 264x + 85$, where c is the cost in dollars, and x is the number of watches repaired. How many watches must he repair to have the lowest cost?

State (Yes or No) whether the given graph appears to represent a quadratic equation.

54)

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Find the quadratic function that fits the set of data points.

55) $(-5, -2), (-4, -1), (-3, 2)$

Answer Key

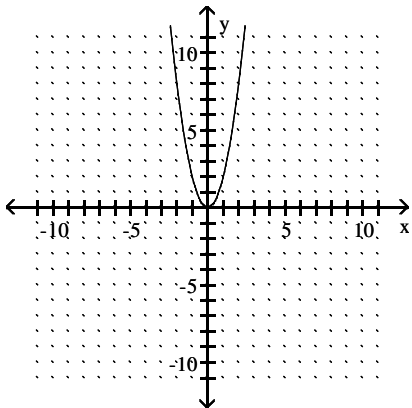
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- 1) ± 3
- 2) 7, 3
- 3) $1 \pm 4i$
- 4) $4 + 2\sqrt{3}, 4 - 2\sqrt{3}$
- 5) $x^2 - 14x + 49; (x - 7)^2$
- 6) $x^2 + 3x + \frac{9}{4}; \left(x + \frac{3}{2}\right)^2$
- 7) $x^2 - \frac{2}{5}x + \frac{1}{25}; \left(x - \frac{1}{5}\right)^2$
- 8) 8, -4
- 9) -3, $-\frac{1}{2}$
- 10) $-4 \pm \sqrt{23}$
- 11) $-2 \pm 6i$
- 12) $(-2 + \sqrt{13}, 0), (-2 - \sqrt{13}, 0)$
- 13) About 7.6 sec
- 14) $\frac{-6 \pm \sqrt{34}}{2}$
- 15) -6, 9
- 16) $6 \pm 3i$
- 17) 3, 7
- 18) $2, -1 \pm i\sqrt{3}$
- 19) $\frac{5 \pm \sqrt{33}}{4}$
- 20) Two different irrational solutions
- 21) Two different imaginary solutions
- 22) $x^2 + 15x + 50 = 0$
- 23) $5x^2 - \frac{34}{3}x + 5 = 0$ OR $15x^2 - 34x + 15 = 0$
- 24) $x^2 + 16 = 0$
- 25) $x^2 - 12x + 26 = 0$
- 26) 9 hr
- 27) 5.9 mph
- 28) 9.7 sec
- 29) $v = \sqrt{2as}$
- 30) $t = \frac{m \pm \sqrt{m^2 + 4rm}}{2}$
- 31) 9.71 seconds

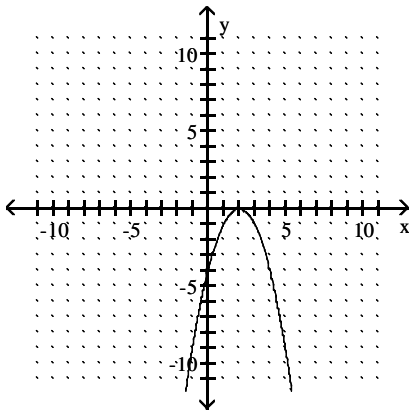
Answer Key

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32)



33)



34) $(-5, -1)$

35) $(18, -9)$

36) $\left(-\frac{1}{7}, 14\right)$

37) $x = -2$

38) 1

39) -3

40) $f(x) = -2(x - 4)^2 + 7$

41) $f(x) = (x - (-1))^2 - 5$

42) $f(x) = 9\left[x - \left(-\frac{2}{9}\right)\right]^2 + \frac{32}{9}$

43) $(-3, -1)$

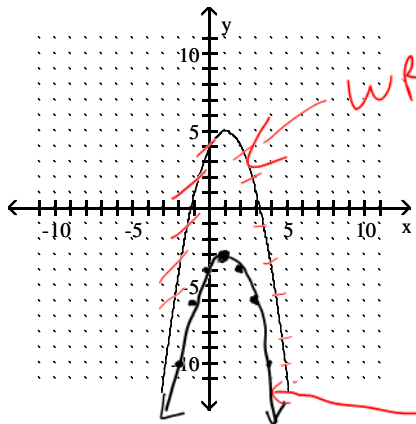
44) $(-5, 2)$

45) $x = 4$

Answer Key

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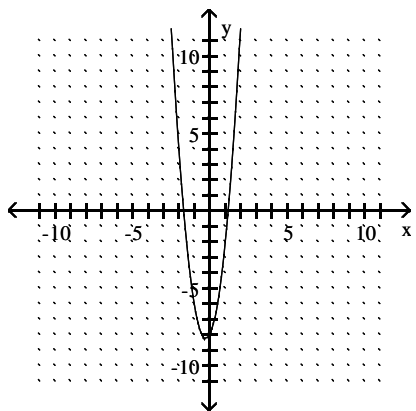
46)



WRONG ANSWER

RIGHT ANSWER

47)



48) $\left(\frac{-5 \pm \sqrt{17}}{4}, 0\right), (0, 2)$

49) x-intercepts (9, 0) and (10, 0); y-intercept (0, -90)

50) 37 and 37

51) 100 ft²

52) 12 sec

53) 33 watches

54) Yes

55) $f(x) = x^2 + 10x + 23$