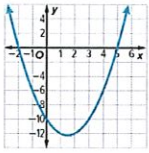
NAME _____ DATE _____ PERIOD _____

3.2 - Solving Quadratic Equations by Graphing ▪ Form A

Example 1



Use the related graph of each equation to determine its solutions.

1. $x^2 - 3x - 10 = 0$

Solve each equation by graphing. Use the attached Graph Paper. Show your table of values.

2. $x^2 - 10x + 21 = 0$ **3.** $x^2 + x - 6 = 0$ **4.** $-x^2 - 6x - 9 = 0$

5. $x^2 + 2x + 3 = 0$ **6.** $-x^2 - 8x - 16 = 0$

Example 2

7. Use a quadratic equation to find two real numbers with a sum of −15 and a product of −54.

Example 3

Solve each equation by graphing. If the exact roots cannot be found, state the consecutive integers between which the roots are located. Use the attached Graph Paper. Show your table of values.

8. $x^2 + 6x + 6 = 0$ **9.** $-x^2 - 4x = 0$

10. $x^2 - 6x + 4 = 0$ **11.** $x^2 - 7 = 0$

Example 4

Use the tables to determine the location of the zeros of each quadratic function. State the consecutive integers between which the roots are located.

12.

x	−7	−6	−5	−4	−3	−2	−1	−0
$f(x)$	−8	−1	4	4	−1	−8	− 22	−48

13.

x	−6	−3	0	3	6	9	12	15
$f(x)$	−6	−1	3	5	3	−1	−6	−14

USE TOOLS Use a table to solve each equation. If the exact roots cannot be found, approximate the roots to the nearest hundredth. Use the attached Graph Paper. Show your table of values.

14. $x^2 - 3x + 2 = 0$ **15.** $x^2 - 2x - 2 = 0$ **16.** $2x^2 - 12x + 17 = 0$

Example 5

PHYSICS Use the formula $h(t) = -16t^2 + v_0t + h_0$, where $h(t)$ is the height of an object in feet, v_0 is the object's initial velocity in feet per second, t is the time in seconds, and h_0 is the initial height in feet from which the object is launched. Round to the nearest tenth, if necessary.

17. A punter kicks a football with an initial upward velocity of 60 feet per second. The ball is 2 feet above the ground when his foot meets the ball. Use a graphing calculator to determine how long will it take the ball to hit the ground.

NAME _____ DATE _____ PERIOD _____

Mixed Exercises

Solve each equation by graphing. If the exact roots cannot be found, state the consecutive integers between which the roots are located. Use the attached Graph Paper. Show your table of values.

18. $-35 = -3x - 2x^2$

19. $-4x^2 = 12x + 8$

20. $0.5x^2 + 0.75 = 0.25x$

21. $2x^2 + x = 11$

Use a graph or table to solve each equation. If exact roots cannot be found, state the consecutive integers between which the roots are located. Use the attached Graph Paper. Show your table of values.

22. $x^2 + 4x = 0$

23. $0.5x^2 - 2x + 2 = 0$

24. $x^2 - 6x + 11 = 0$

~~**REGULARITY** **Use a quadratic equation to find two real numbers that satisfy each situation, or show that no such numbers exist.**~~

~~**25.** Their sum is 4, and their product is −117.~~

~~**26.** Their sum is −13, and their product is 42.~~

27. **BRIDGES** In 1895, a brick arch railway bridge was built on North Avenue in Baltimore, Maryland. The arch is described by the equation $h = 9 - \frac{1}{50}x^2$, where h is the height in yards and x is the distance in yards from the center of the bridge. Graph this equation and describe, to the nearest yard, where the bridge touches the ground.

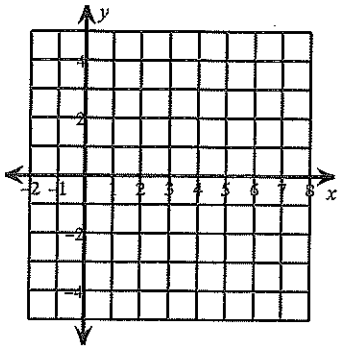
28. **VOLCANOES** A volcanic eruption blasts a boulder upward with an initial velocity of 240 feet per second. The height h of the boulder in feet, t seconds after the eruption can be modeled by the function $h(t) = -16t^2 + v_0t$. How long will it take the boulder to hit the ground if it lands at the same elevation from which it was ejected?

~~**29.** **HIKING** Antonia is hiking and reaches a steep part of the trail that runs along the edge of a cliff. In order to descend more safely, she drops her heavy backpack over the edge of the cliff so that it will land on a lower part of the trail, 38.75 feet below. The height $h(t)$ of an object t seconds after it is dropped straight down can also be modeled by the function $h(t) = -16t^2 + v_0t + h_0$, where v_0 is the initial velocity of the object, and h_0 is the initial height.~~

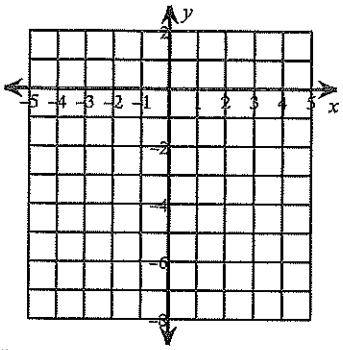
~~**a.** Write a quadratic function that can be used to determine the amount of time t that it will take for the backpack to land on the trail below the cliff after Antonia drops it.~~

~~**b.** Use a graphing calculator to determine how long until the backpack hits the ground. Round to the nearest tenth.~~

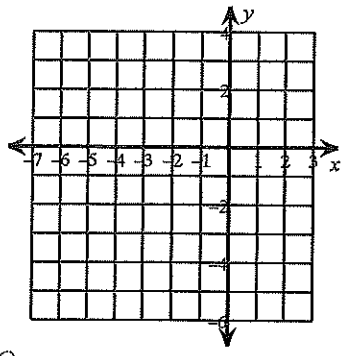
2)



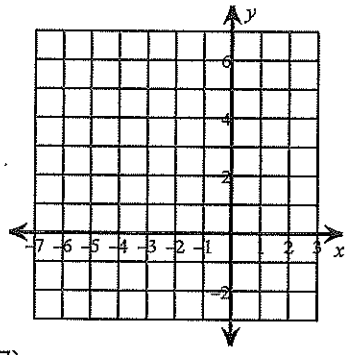
3)



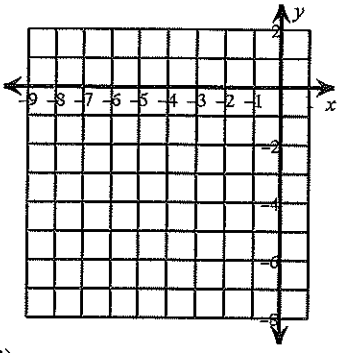
4)



5)

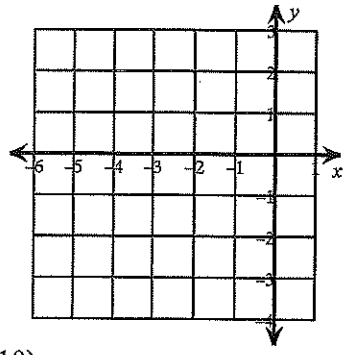


6)

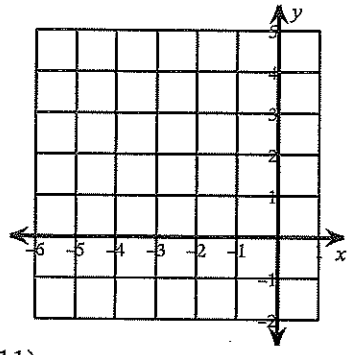


7)

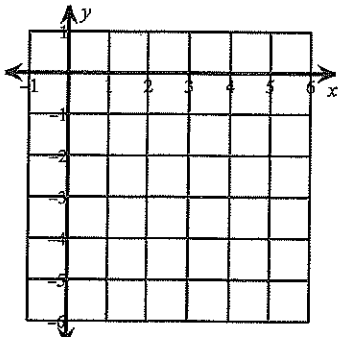
8)



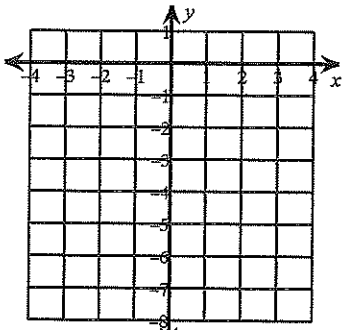
9)



10)

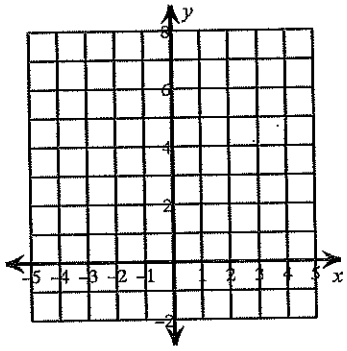


11)



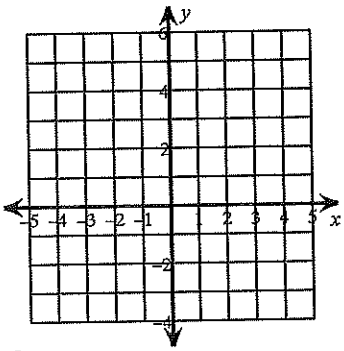
12)

14)

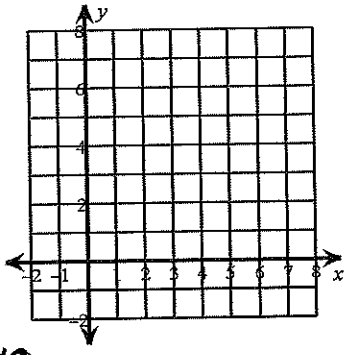


13)

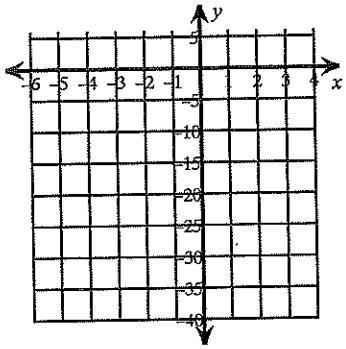
15)



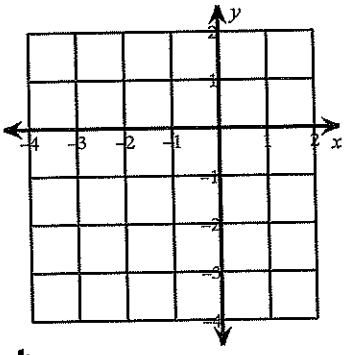
16)



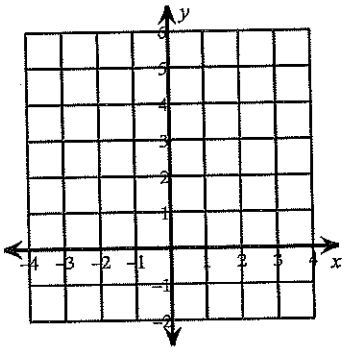
18)



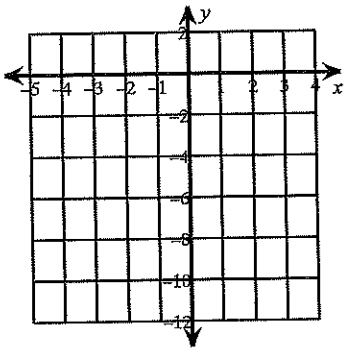
19)



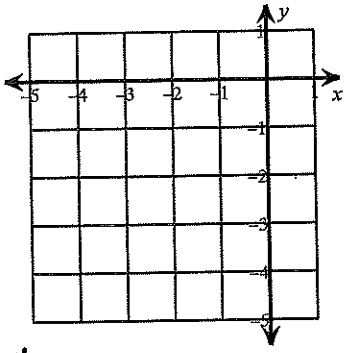
20)



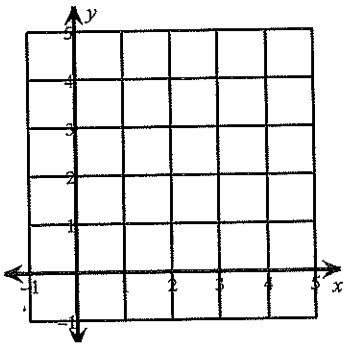
21)



22)



23)



24)