NAME _____ DATE _____ PERIOD _____

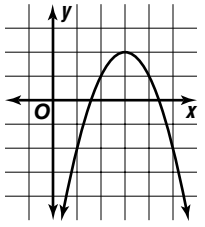
10-2 Solving Quadratic Equations by Graphing *(Pages 533–538)*

The solutions of a quadratic equation are called the **roots** of the equation. You can find the real number roots by finding the x-intercepts or **zeros** of the related quadratic function. Quadratic equations can have two distinct real roots, one distinct root, or no real roots. These roots can be found by graphing the equation to see where the parabola crosses the x-axis.

Examples

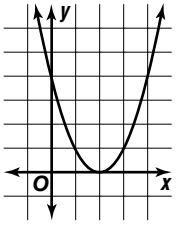
Describe the real roots of the quadratic equations whose related functions are graphed below.

a.



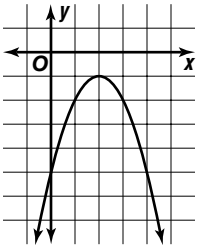
The parabola crosses the x-axis twice. One root is between 1 and 2, and the other is between 4 and 5.

b.



Since the vertex of the parabola lies on the x-axis the function has one distinct root, 2.

c.

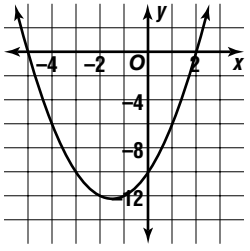


This parabola does not intersect the x-axis, so there are no real roots. The solution set is ∅.

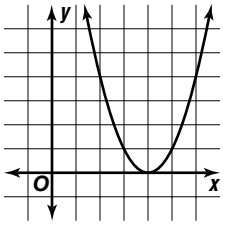
Practice

State the real roots of each quadratic equation whose related function is graphed below.

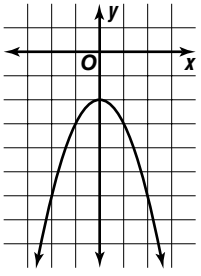
1.



2.



3.



Solve each equation by graphing. If integral roots cannot be found, state the consecutive integers between which the roots lie.

4. $x^2 + 2x - 3 = 0$

5. $-m^2 + 8m - 16 = 0$

6. $-g^2 + 4g - 5 = 0$

7. $4k^2 - 8k + 4 = 0$

8. $h^2 - 3 = 0$

9. $n^2 - 4n + 6 = 0$

10. $w^2 + 2w = 0$

11. $-v^2 + 6v - 7 = 0$

12. $t^2 - 4 = 0$

13. **Standardized Test Practice** The real roots of a quadratic equation correspond to the ___?___ of the graph of the related function.

A x-intercepts **B** y-intercepts **C** vertex **D** maximum

Answers: **1.** −5, 2 **2.** 4 **3.** ∅ **4.** −3, 1 **5.** 4 **6.** ∅ **7.** 1 **8.** between 1 and 2; between −1 and −2 **9.** ∅ **10.** −2, 0 **11.** between 1 and 2; between 4 and 5 **12.** −2, 2 **13.** A