

## THINK AND DISCUSS

- Describe how to use the discriminant to find the number of real solutions to a quadratic equation.
- Choose a method to solve  $x^2 + 5x + 4 = 0$  and explain why you chose that method.
- Describe how the discriminant can be used to determine if an object will reach a given height.
- GET ORGANIZED** Copy and complete the graphic organizer. In each box, write the number of real solutions.

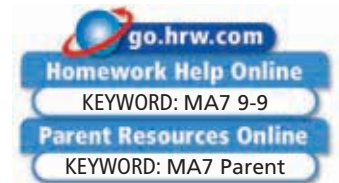


The number of real solutions of  $ax^2 + bx + c = 0$  when...

$b^2 - 4ac > 0$  is .  $b^2 - 4ac < 0$  is .  $b^2 - 4ac = 0$  is .

## 9-9

## Exercises



### GUIDED PRACTICE

- Vocabulary** If the *discriminant* is negative, the quadratic equation has \_\_\_\_\_ ? \_\_\_\_\_ real solution(s). (*no, one, or two*)

Solve using the Quadratic Formula.

SEE EXAMPLE 1  
p. 671

2.  $x^2 - 5x + 4 = 0$

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

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

5.  $x^2 = -14x - 40$

6.  $3x^2 - 2x = 8$

7.  $4x^2 - 4x - 3 = 0$

SEE EXAMPLE 2  
p. 671

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

9.  $x^2 + 6x + 3 = 0$

10.  $x^2 - 7x + 2 = 0$

11.  $3x^2 = -x + 5$

12.  $x^2 - 4x - 7 = 0$

13.  $2x^2 + x - 5 = 0$

SEE EXAMPLE 3  
p. 672

Find the number of real solutions of each equation using the discriminant.

14.  $2x^2 + 4x + 3 = 0$

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

16.  $2x^2 - 11x + 6 = 0$

17.  $x^2 + x + 1 = 0$

18.  $3x^2 = 5x - 1$

19.  $-2x + 3 = 2x^2$

20.  $2x^2 + 12x = -18$

21.  $5x^2 + 3x = -4$

22.  $8x = 1 - x^2$

SEE EXAMPLE 4  
p. 673

- Hobbies** The height above the ground in meters of a model rocket on a particular launch can be modeled by the equation  $h = -4.9t^2 + 102t + 100$ , where  $t$  is the time in seconds after its engine burns out 100 m above the ground. Will the rocket reach a height of 600 m? Use the discriminant to explain your answer.

SEE EXAMPLE 5  
p. 673

Solve.

24.  $x^2 + x - 12 = 0$

25.  $x^2 + 6x + 9 = 0$

26.  $2x^2 - x - 1 = 0$

27.  $4x^2 + 4x + 1 = 0$

28.  $2x^2 + x - 7 = 0$

29.  $9 = 2x^2 + 3x$