

# 6.32

## Discriminant of a Quadratic Equation

### • Example 1

How many real solutions are there for each of the following quadratic equations?

(a)  $x^2 + 7x - 15 = 0$

The discriminant  $[49 - 4(1)(-15)]$  is 109. This indicates that there are two real solutions.

(b)  $3x^2 - 5x + 7 = 0$

The discriminant is negative. There are no real solutions.

(c)  $9x^2 - 12x + 4 = 0$

The discriminant is 0. There is exactly one real solution.

### ● ● ● CHECK YOURSELF 1

How many real solutions are there for each of the following quadratic equations?

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

b.  $3x^2 + x - 11 = 0$

c.  $4x^2 - 4x + 1 = 0$

d.  $x^2 = -5x - 7$

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### ● ● ● CHECK YOURSELF ANSWER

1. (a) None; (b) two; (c) one; (d) none.

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# 6.32 Exercises

Name \_\_\_\_\_

Section \_\_\_\_\_

Date \_\_\_\_\_

## A N S W E R S

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

Find the value of the discriminant and give the number of real solutions.

1.  $2x^2 - 5x = 0$

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

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

4.  $4p^2 + 12p + 9 = 0$

5.  $3x^2 - 7x + 1 = 0$

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

7.  $2w^2 - 5w + 11 = 0$

8.  $7q^2 - 3q + 1 = 0$