3.R.8 Exercises

Concept Check

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

1. When solving quadratic equations by factoring, it is important that all of the coefficients are integers.

2. The standard form for a quadratic equation is $ax^2 + bx = c$.

3. Not all quadratic equations can be solved by factoring.

4. All quadratic equations have two distinct solutions.

Practice

Solve each equation by factoring.

5. $x^2 - 11x + 18 = 0$

6. $9x^2 + 63x + 90 = 0$

7. $(x - 5)(x + 3) = 9$

8. Find a polynomial equation with integer coefficients that has $x = 5$ and $x = 7$ as roots.

Applications

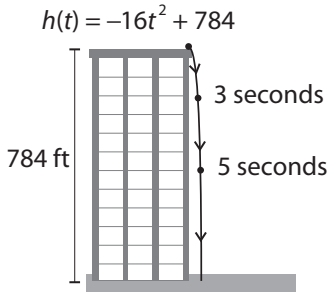
Solve.

9. ***Falling Objects:*** A ball is dropped from the top of a building that is 784 feet high. The height of the ball above ground level is given by the polynomial function $h(t) = -16t^2 + 784$ where t is measured in seconds.

a. How high is the ball after 3 seconds? 5 seconds?

b. How far has the ball traveled in 3 seconds? 5 seconds?

c. When will the ball hit the ground? Explain your reasoning in terms of factors.



10. ***Falling Objects:*** A tennis ball is dropped from a building. The position of the ball after t seconds is given by the polynomial function $s(t) = -4.9t^2 + 490$, where s is the height in meters of the ball.

a. Find $s(0)$. What does this value represent in the context of this problem?

b. How high is the tennis ball 2 seconds after it has been dropped?

c. How long before the tennis ball hits the ground?

Writing & Thinking

11. When solving equations by factoring, one side of the equation must be 0. Explain why this is so.

12. In solving the equation $(x+5)(x-4) = 6$, why can't we just put one factor equal to 3 and the other equal to 2? Certainly $3 \cdot 2 = 6$.