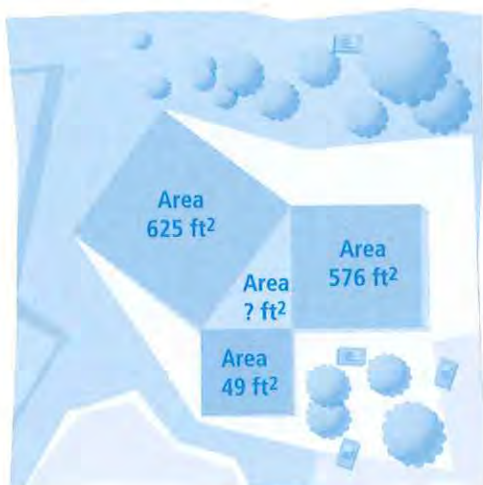


EXPLORE & REASON

A developer is building 3 recreation square areas on a parcel of land. He has not decided what to do with the enclosed triangular area in the center.



- A. How can you determine the side lengths of the triangle in the center?
- B. What relationships do you notice among the areas of the squares?
- C. **Look for Relationships** How can the developer adjust this plan so that each recreation area covers less area but still has a similar triangular section in the middle? Explain. © MP.7

HABITS OF MIND

Make Sense and Persevere The Product Property of Square Roots states that $\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$ when both a and b are greater than or equal to 0. Explain why it is essential that a and b are greater than or equal to 0. © MP.1

EXAMPLE 1  **Try It!** Solve Equations of the Form $x^2 = a$

1. Solve each equation by inspection.

a. $x^2 = 169$

b. $x^2 = -16$

EXAMPLE 2  **Try It!** Solve Equations of the Form $ax^2 = c$

2. What are the solutions for each equation? If the solution is not a perfect square, state what two integers the solution is between.

a. $5x^2 = 125$

b. $-\frac{1}{2}x^2 = -36$

HABITS OF MIND

Construct Arguments What is an advantage of solving a quadratic equation using square roots? What is a disadvantage? Explain your reasoning. © MP.3

**EXAMPLE 3** **Try It!** Solve Equations of the Form $ax^2 + b = c$

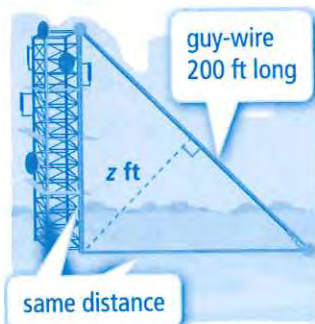
3. Solve the quadratic equations.

a. $-5x^2 - 19 = 144$

b. $3x^2 + 17 = 209$

EXAMPLE 4 **Try It!** Determine a Reasonable Solution

4. Find the distance from the base of the tower to the midpoint of the guy-wire.

**HABITS OF MIND****Communicate Precisely** When is the negative square root not a reasonable solution? Explain and give an example. © MP.6

Do You UNDERSTAND?

1. **ESSENTIAL QUESTION** How can square roots be used to solve quadratic equations?

2. **Construct Arguments** How many solutions does $ax^2 = c$ have if a and c have different signs? Explain. © MP.3

3. **Reason** How do you decide when to use the \pm symbol when solving a quadratic equation? © MP.2

4. **Error Analysis** They solved $2x^2 = 98$ and said that the solution in 7. Is he correct? Why or why not? © MP.3

5. **Communicate Precisely** How is solving an equation in the form $ax^2 = c$ similar to solving an equation in the form $ax^2 + b = c$? How are they different?

Do You KNOW HOW?

Solve each equation by inspection.

6. $x^2 = 400$

7. $x^2 = -25$

Solve each equation.

8. $3x^2 = 400$

9. $-15x^2 = -90$

10. $2x^2 + 7 = 31$

11. $2x^2 - 7 = 38$

12. $-4x^2 - 1 = 48$

13. $-4x^2 + 50 = 1$

14. $3x^2 + 2x^2 = 150$

15. $3x^2 + 18 = 5x^2$

Solve for x .

