EXPLORATION

8-5 Solving Rational Equations and Inequalities

A rancher wants to build a rectangular holding pen.

1. The pen will have an area of 450 ft^2. Let w represent the width of the pen. Write an expression in terms of w for the length of the pen.

2. The length of the pen will be twice the width. Use this information to write a second expression in terms of w for the length of the pen.

3. Write an equation by setting the two expressions you wrote for the length of the pen equal to each other.

4. Solve the equation for w.

5. What will be the dimensions of the holding pen?

THINK AND DISCUSS

6. **Describe** the steps you used to solve the equation in Problem 4.

7. **Explain** how you could check your solution to the equation.

8. **Tell** how you knew which value of w to use for the width of the pen.

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2. The length of the pen will be twice the width. Use this information to write a second expression in terms of w for the length of the pen. $2w$

3. Write an equation by setting the two expressions you wrote for the length of the pen equal to each other. $\frac{450}{w} = 2w$

4. Solve the equation for w. $w = \pm 15$

5. What will be the dimensions of the holding pen? 15 ft by 30 ft

THINK AND DISCUSS

6. **Describe** the steps you used to solve the equation in Problem 4.

7. **Explain** how you could check your solution to the equation.

8. **Tell** how you knew which value of w to use for the width of the pen.

6. Possible answer: Multiply both sides of the equation by w. Divide both sides of the equation by 2. Then take the square root of both sides.

7. Possible answer: Substitute each solution into the original equation and check whether it makes the equation true.

8. Because the width must be a positive value, use the solution $w = 15$, not $w = -15$.