Solution

$$\begin{aligned}\left(\frac{f}{g}\right)(x) &= \frac{f(x)}{g(x)} \\ &= \frac{\dfrac{x^2-25}{x}}{\dfrac{x+5}{2x}} \\ &= \frac{x^2-25}{x}\cdot\frac{2x}{x+5} \\ &= \frac{\cancel{(x+5)}(x-5)2\cancel{x}}{\cancel{x}\cancel{(x+5)}} \\ &= \frac{2(x-5)}{1} \\ &= 2x-10\end{aligned}$$

5.R.6 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. The reciprocal of $\dfrac{x}{x+3}$ is $\dfrac{-x-3}{x}$.

2. Dividing rational expressions is similar to dividing fractions.

3. There are no restrictions on the denominator $12x^2$.

4. Because $\dfrac{4x^2}{16x}$ reduces to $\dfrac{x}{4}$, there are no restrictions on the denominator.

©HAWKES LEARNING

Practice

Perform the indicated operations and reduce to lowest terms. Assume that no denominator has a value of 0.

5. $\dfrac{x^2-9}{x^2+2x}\cdot\dfrac{x+2}{x-3}$

6. $\dfrac{2x^2+x-3}{x^2+4x}\cdot\dfrac{2x+8}{x-1}$

7. $\dfrac{x-1}{6x+6}\div\dfrac{2x-2}{x^2+x}$

8. $\dfrac{x+3}{x^2+3x-4}\div\dfrac{x+2}{x^2+x-2}$

©HAWKES LEARNING

Applications

Solve

9. ***Carpentry:*** Erik is building a cubby bookshelf, that is, a bookshelf divided into storage holes (cubbies) instead of shelves. He wants the height of the bookshelf to be $x^2 - 3x - 10$ and the width to be $x^2 + 5x + 6$. Each cubby hole in the bookshelf will have a height of $x + 3$ and a width of $x - 5$.

a. Write a rational expression to determine how many cubbies high the bookshelf will be.

b. Write a rational expression to determine how many cubbies wide the bookshelf will be.

c. Multiply the rational expressions from Parts **a.** and **b.** (and reduce to lowest terms) to obtain a rational expression that gives the total number of cubbies in the entire bookshelf.

©HAWKES LEARNING