

**Simplifying Rational Expressions Using Multiplication and Division**

Simplify the rational expressions, if possible.

1.  $\frac{x^2-8x-9}{x^2-1}$  Excluded  
 $x \neq \pm 1$

$$\frac{x-9}{x-1}$$

2.  $\frac{x+3}{x^2+5x+6}$  Excluded  
 $x \neq -3, -2$

$$\frac{1}{x+2}$$

3.  $\frac{x^2-4}{x^2+4}$  Excluded  
None

$$\frac{(x-2)(x+2)}{x^2+4}$$

Multiply or divide. Identify any x-values for which the expression is undefined.

4.  $\frac{x^2-5x}{x^3} \cdot \frac{x-2}{x^2-3x-10}$  Excluded  
 $x \neq -2, 0, 5$

$$\frac{x-2}{x^2(x+2)}$$

5.  $\frac{x^2-49}{x^2-4} \div \frac{x^2-5x-14}{x^2-7x+10}$  Excluded  
 $x \neq \pm 2, -4$

$$\frac{(x+7)(x-5)}{(x+2)^2}$$

$$6. \frac{w^2-6w+5}{w^2+3w+2} \div \frac{w^2-25}{w^2+6w+5}$$

Excluded  
 $w \neq \pm 5, -1, -2$

$$\frac{w-1}{w+2}$$

$$7. \frac{x^2-x-12}{x^2+7x+12} \cdot \frac{x^2+6x+8}{x^2-5x+4}$$

Excluded  
 $x \neq \pm 4, -3, 1$

$$\frac{x+2}{x-1}$$

$$8. \frac{10x-40}{x^2-6x+8} \cdot \frac{x+3}{5x+15}$$

Excluded  
 $x \neq -3, 2, 4$

$$\frac{2}{x-2}$$

$$9. \frac{x}{15} \cdot \frac{x^7}{2x} \cdot \frac{20}{x^4}$$

Excluded  
 $x \neq 0$

$$\frac{2x^3}{3}$$