

*** COMPLETE ON A SEPARATE SHEET OF PAPER***

Simplify each expression. State the excluded values of the variables.

7. $\frac{56x^2y}{70x^3y^2}$

8. $\frac{x^2 - 49}{x + 7}$

9. $\frac{x + 4}{x^2 + 8x + 16}$

7. $\frac{x-3}{x^2-4} \cdot \frac{x+2}{x^2-6x+9}$

8. $\frac{x+y}{x-1} \cdot \frac{x^2-2x+1}{x^2-y^2}$

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

10. $\frac{x^2+7x+12}{x-5} \div \frac{x^2+9x+18}{x^2-7x+10}$

11. $\frac{x+3}{2x-1} + \frac{x-1}{2x-1}$

12. $\frac{1}{3x^2} + \frac{5}{2x^3}$

13. $\frac{1}{x-3} + \frac{3}{x^3-27}$

14. $\frac{x}{x^2-6x+9} + \frac{3}{2x^2-5x-3}$

15. $\frac{2}{x^2-x-12} - \frac{4}{x^2+6x+9}$

16. $\frac{x}{2x^2-3x-20} - \frac{1}{2x^2+7x+5}$

38. **CRITICAL THINKING** Identify the expressions that are equivalent to $\frac{x}{y}$. Explain why the expressions are equivalent.

a. $\frac{x+3}{y+3}$

b. $\frac{3-x}{3-y}$

c. $\frac{3x}{3y}$

d. $\frac{x^3}{y^3}$

e. $\frac{n^3x}{n^3y}$

3. **FIND THE ERROR** Amiri and Hoshi multiplied $\frac{x-3}{x+3}$ and $\frac{4x}{x^2-4x+3}$.

Amiri

$$\begin{aligned} \frac{x-3}{x+3} \cdot \frac{4x}{x^2-4x+3} \\ &= \frac{\cancel{(x-3)}4x}{(x+3)\cancel{(x-3)}(x-1)} \\ &= \frac{4x}{(x+3)(x-1)} \end{aligned}$$

Hoshi

$$\begin{aligned} \frac{x-3}{x+3} \cdot \frac{4x}{x^2-4x+3} \\ &= \frac{\cancel{x-3}}{\cancel{x+3}} \cdot \frac{\cancel{4x}}{x^2-\cancel{4x}+3} \\ &= \frac{1}{x^2+3} \end{aligned}$$

Who is correct? Explain your reasoning.

Solve each equation. State any extraneous solutions.

22. $\frac{2n}{n-4} - 2 = \frac{4}{n+5}$

23. $\frac{3}{x^2+5x+6} - \frac{7}{x+3} = -\frac{x-1}{x+2}$

11. $\frac{4}{a} = \frac{3}{a-2}$

12. $\frac{3}{x} = \frac{1}{x-2}$

13. $\frac{x-3}{x} = \frac{x-3}{x-6}$