

Assignment 1: Simplifying, Multiplying, and Dividing Rational Expressions

1. State the non-permissible values for the following expressions and simplify.

a) $\frac{6ab^2}{11bc}$

$$= \boxed{\frac{6ab}{11c}} \quad b, c \neq 0$$

b) $\frac{x-3}{x^2-9}$

$$= \frac{\cancel{(x-3)}}{\cancel{(x-3)}(x+3)}$$

$$= \boxed{\frac{1}{x+3}} \quad x \neq \pm 3$$

c) $\frac{x^3}{2x^2+8x}$

$$= \frac{x^3}{2x(x+4)} = \boxed{\frac{x^2}{2(x+4)}}$$

$$x \neq -4, 0.$$

d) $\frac{4x+8}{2x}$

$$= \frac{\cancel{2}4(x+2)}{\cancel{2}x}$$

$$= \boxed{\frac{2(x+2)}{x}} \quad x \neq 0$$

e) $\frac{3x^2-9x}{3x}$

$$= \frac{\cancel{3}x(x-3)}{\cancel{3}x}$$

$$= \boxed{x-3} \quad x \neq 0$$

f) $\frac{4x-8}{x^2-4}$

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

$$= \boxed{\frac{4}{x+2}} \quad x \neq \pm 2$$

2. Perform the indicated operation to simplify fully.

a) $\frac{2 \cdot 4a^2 \cdot 2}{7b^2 \cdot 2a}$

$$= \boxed{\frac{4a}{7b^2}} \quad a, b \neq 0$$

b) $\frac{\cancel{(x-3)}(x+2)}{(x+4)\cancel{(x-3)}}$

$$= \boxed{\frac{(x+2)}{(x+4)}}$$

$$x \neq -4, 3.$$

c) $\frac{2 \cdot 6y^2 \cdot (y+3)}{(y+3) \cdot 5}$

$$= \boxed{\frac{24}{5}} \quad y \neq 0, -3.$$

$$d) \frac{4x^2}{y} \div \frac{5x}{3y^2}$$

$$= \frac{4x^2}{y} \cdot \frac{3y^2}{5x} = \boxed{\frac{12xy}{5}}$$

$$x, y \neq 0$$

$$e) \frac{x+3}{5x-1} \div \frac{2x+6}{4x}$$

$$= \frac{(x+3)}{(5x-1)} \cdot \frac{2\cancel{4}x}{\cancel{2}(x+3)}$$

$$= \boxed{\frac{2x}{(5x-1)}} \quad x \neq 0, -3, \frac{1}{5}$$

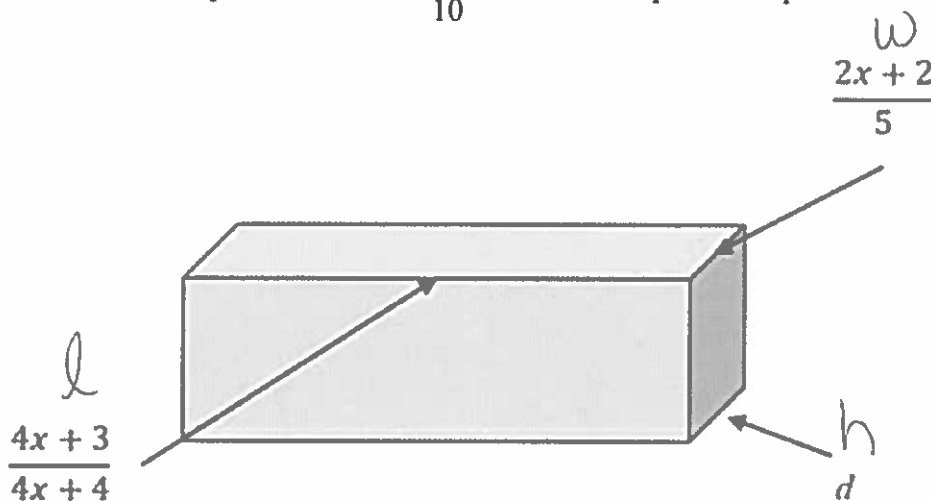
$$f) \frac{x^2}{x+7} \div \frac{x^2-16}{x^2-49}$$

$$= \frac{x^2}{(x+7)} \cdot \frac{\cancel{(x+7)}(x-7)}{(x+4)(x-4)}$$

$$= \boxed{\frac{x^2(x-7)}{(x+4)(x-4)}}$$

$$x \neq \pm 4, \pm 7$$

3. The volume of the prism below is $\frac{3x+8}{10}$. Find the depth of the prism.



$$\frac{V}{lw} = \frac{dwh}{lw}$$

$$d = \frac{V}{lw} = \frac{3x+8}{10} \div \frac{4x+3}{4x+4} \div \frac{2x+2}{5}$$

$$= \frac{(3x+8)}{\cancel{2}10} \cdot \frac{\cancel{4}(x+1)}{(4x+3)} \cdot \frac{\cancel{5}}{\cancel{2}(x+1)} = \boxed{\frac{(3x+8)}{(4x+3)}} \quad x \neq -1, \frac{3}{4}$$