

## 5.5 Rational Expressions Review

Simplify each expression:

$$1. \frac{3x-6}{5x-20} \cdot \frac{x-8}{5x-10}$$

$$\frac{\cancel{3(x-2)}}{5(x-4)} \cdot \frac{x-8}{\cancel{5(x-2)}} = \boxed{\frac{3(x-8)}{25(x-4)}}$$

$$2. \frac{14x+7}{4x-6} \cdot \frac{8x-12}{42x+21}$$

$$\frac{7(2x+1)}{2(2x-3)} \cdot \frac{4(2x-3)}{21(2x+1)} = \frac{28}{42} = \boxed{\frac{2}{3}}$$

$$3. \frac{y^2-25}{(y+5)^2} \div \frac{2y-10}{4y+20}$$

$$\frac{(y+5)(y-5)}{(y+5)(y+5)} \cdot \frac{4(y+5)}{2(y-5)} = \boxed{2}$$

$$4. \frac{y^2-25}{y^2-16} \div \frac{2y+10}{y^2-4y}$$

$$\frac{(y+5)(y-5)}{(y+4)(y-4)} \cdot \frac{y(y-4)}{2(y+5)} = \boxed{\frac{y(y-5)}{2(y+4)}}$$

$$5. \frac{8}{3x^3y} + \frac{4}{9xy^3}$$

COMMON DENOM:  $9x^3y^3$

$$\frac{3y^2}{3y^2} \cdot \frac{8}{3x^3y} + \frac{4}{9xy^3} \cdot \frac{x^2}{x^2}$$

$$\frac{24y^2}{9x^3y^3} + \frac{4x^2}{9x^3y^3} = \boxed{\frac{24y^2+4x^2}{9x^3y^3}}$$

$$6. \frac{7}{5y+25} + \frac{4}{3y+15}$$

$$\frac{3}{3} \cdot \frac{7}{5(y+5)} + \frac{4}{3(y+5)} \cdot \frac{5}{5}$$

$$\frac{21}{15(y+5)} + \frac{20}{15(y+5)} = \boxed{\frac{41}{15(y+5)}}$$

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

$$\frac{5xy}{2y(y+2)} - \frac{6}{y(y+2)}$$

$$\boxed{\frac{5xy-12}{2y(y+2)}}$$

$$8. 3x - \frac{x^2+5x}{x^2-2}$$

$$\frac{3x(x^2-2)}{x^2-2} - \frac{x^2+5x}{x^2-2} = \frac{3x^3-6x-x^2-5x}{x^2-2}$$

$$\boxed{\frac{3x^3-x^2-11x}{x^2-2}}$$

$$9. \frac{\frac{3}{2y}}{\frac{8x}{y}} \cdot \frac{8x}{6} = \frac{24x}{12y} = \boxed{\frac{2x}{y}}$$

$$10. \frac{\frac{1}{x}+3}{4+\frac{5}{y}} = \frac{\frac{1}{x}+\frac{3x}{x}}{\frac{4y}{y}+\frac{5}{y}} = \frac{\frac{1+3x}{x}}{\frac{4y+5}{y}}$$

$$\frac{1+3x}{x} \cdot \frac{y}{4y+5} = \boxed{\frac{y+3xy}{4xy+5x}}$$

## 5.6 Solving Rational Equations Day 1

Solve. Check for extraneous solutions.

$$1. \frac{m-1}{5} = \frac{8}{2} \quad 2(m-1) = 40$$

$$m-1 = 20$$

$$\boxed{m=21}$$

$$2. \frac{v-5}{v+6} = \frac{4}{9} \quad 9(v-5) = 4(v+6)$$

$$9v-45 = 4v+24$$

$$5v-45 = 24$$

$$5v = 69$$

$$\boxed{v = \frac{69}{5}}$$