

Name Key

Rational Expression Worksheet #4: Multiplying & Dividing

Multiply or divide the rational expressions. Show work & factor when necessary.

1. $\frac{2x+6}{5x+10} \cdot \frac{x+2}{x^2+4x+3}$ $x \neq -2, -1, -3$
 $\frac{2(\cancel{x+3})}{5(\cancel{x+2})} \cdot \frac{\cancel{x+2}}{(\cancel{x+1})(x+3)} = \boxed{\frac{2}{5(x+1)}}$

2. $\frac{x^2-x-12}{3x-9} \div \frac{x-4}{12}$ $x \neq 3, 4$
 $\frac{(x-4)(x+3)}{3(x-3)} \times \frac{4\cancel{12}}{\cancel{x-4}} = \boxed{\frac{4(x+3)}{x-3}}$

3. $\frac{x^2-5x+4}{x^2} \div \frac{x-1}{x}$ $x \neq 0, 1$
 $\frac{(x-4)(\cancel{x-1})}{x^2} \times \frac{x}{\cancel{x-1}} = \boxed{\frac{x-4}{x}}$

4. $\frac{6}{x^2+9x+20} \cdot \frac{8x+40}{6x-12}$ $x \neq -4, -5, 2$
 $\frac{6}{(x+4)(x+5)} \cdot \frac{8(x+5)}{6(x-2)} = \boxed{\frac{8}{(x+4)(x-2)}}$

5. $\frac{5x-15}{4x^2} \cdot \frac{x^3}{6x-18}$ $x \neq 0, 3$
 $\frac{5(\cancel{x-3})}{4\cancel{x^2}} \cdot \frac{\cancel{x^3}}{6(\cancel{x-3})} = \boxed{\frac{5x}{24}}$

6. $\frac{7x^2}{12x} \div \frac{14x^3}{48y^3}$ $x \neq 0, y \neq 0$
 $\frac{7\cancel{x}}{12\cancel{x}} \times \frac{24\cancel{4}y^3}{\cancel{14}x^3} = \boxed{\frac{2y^3}{x^2}}$

7. $\frac{x^2+5x-24}{2x+2} \div \frac{3x+24}{x^2-8x-9}$ $x \neq -1, -2, 9$
 $\frac{(x+8)(x-3)}{2(\cancel{x+1})} \times \frac{(x-9)(\cancel{x+1})}{3(\cancel{x+3})} = \boxed{\frac{(x-3)(x-9)}{6}}$

8. $\frac{24x^3}{50x} \cdot \frac{30}{8x^2}$ $x \neq 0$
 $\boxed{\frac{9}{5}}$

9. $\frac{4x}{8x+8} \cdot \frac{x^2+8x+7}{8x^3}$ $x \neq 0, -1$
 $\frac{4\cancel{x}}{2\cancel{4}(\cancel{x+1})} \times \frac{(x+1)(x+7)}{8x^3} = \boxed{\frac{(x+7)}{16x^2}}$

10. $\frac{6x-12}{x^2-9x+18} \cdot \frac{7x-21}{5x-10}$ $x \neq 2, 9$
 $\frac{6(\cancel{x-2})}{(\cancel{x-2})(x-9)} \times \frac{7(x-3)}{5(x-2)} = \boxed{\frac{42(x-3)}{5(x-9)(x-2)}}$