

4.1 → Simplify, Multiply + Divide Rationals

ex. 1 $\frac{x^2+5x}{x^2} \cdot \frac{x(x+5)}{x^2} = \frac{x+5}{x} \quad x \neq 0$

ex. 2 $\frac{x^2-4x-12}{x^2-4} \cdot \frac{(x-6)(x+2)}{(x-2)(x+2)} = \frac{x-6}{x-2} \quad x \neq 2, -2$

ex. 3 $\frac{5x^2y}{2xy^3} \cdot \frac{6x^3y^2}{10y} = \frac{30x^5y^3}{20xy^4} = \frac{3x^4}{2y} \quad x, y \neq 0$

ex. 4 $\frac{-4x^2+4x}{4x-4x^2} \cdot \frac{x^2+x-6}{4x} \cdot \frac{-4x(x-1)}{(x+3)(x-1)} \cdot \frac{(x+3)(x-2)}{4x}$
 $= \frac{-(x-2)}{1} \text{ or } -x+2$
 $x \neq -3, 1$

ex. 5 $\frac{x+3}{8x^3-1} \cdot \frac{4x^2+2x+1}{(2x-1)(4x^2+2x+1)} \cdot \frac{x+3}{1}$
 $= \frac{x+3}{2x-1}$

ex. 6

$$\frac{5x}{3x-12} \div \frac{x^2-2x}{x^2-6x+8} = \frac{5x}{3(x-4)} \cdot \frac{(x-4)(x-2)}{x(x-2)}$$
$$\frac{5x}{3x} = \boxed{\frac{5}{3}}$$

ex. 7

$$\frac{x}{x+5} \cdot 3x-5 \div \frac{9x^2-25}{x+5}$$

$$\frac{x}{x+5} \cdot \frac{3x-5}{1} \cdot \frac{x+5}{(3x-5)(3x+5)} = \boxed{\frac{x}{3x+5}}$$

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