

Honors Algebra II  
Unit 5 – Rational Functions



MATH, ENGINEERING,  
AND SCIENCE ACADEMY

Rational Expressions

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**Short Answer:** Show all work. All final responses must contain excluded values.

**Simplify (remember to factor when necessary).**

$$1. \frac{12x^6}{42x^4} = \frac{2x^2}{7}$$

$$2. \frac{x^2 + 8x + 15}{3x + 9} = \frac{(x+3)(x+5)}{3(x+3)} = \frac{x+5}{3}$$

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

$$4. \frac{x^2 - 6x + 8}{x^2 + 2x - 24} = \frac{(x-2)(x-4)}{(x+6)(x-4)} = \frac{x-2}{x+6}$$

**Add or subtract (remember to factor when necessary).**

$$5. \frac{7}{5} + \frac{12}{5x} = \frac{7x}{5x} + \frac{12}{5x} = \frac{7x+12}{5x}$$

$$6. \frac{9}{x-3} - \frac{2}{x+2} = \frac{9(x+2)}{(x-3)(x+2)} - \frac{2(x-3)}{(x+2)(x-3)} = \frac{9x+18}{(x+2)(x-3)} - \frac{2x-6}{(x+2)(x-3)} = \frac{7x+24}{(x+2)(x-3)}$$

\* Remember you're subtracting \*

$$7. \frac{3x}{x-6} + \frac{6x}{4x-24} = \frac{12x}{4x-24} + \frac{6x}{4x-24} = \frac{18x}{4x-24} \text{ or } \frac{9x}{2x-12}$$

If they simplify online \*

$$8. \frac{6x-7}{x^2+6x+5} + \frac{4}{x+5} = \frac{6x-7}{(x+1)(x+5)} + \frac{4(x+1)}{(x+1)(x+5)} = \frac{6x+7}{(x+1)(x+5)} + \frac{4x+4}{(x+1)(x+5)} = \frac{10x+11}{(x+1)(x+5)}$$

# Honors Algebra II

## Unit 5 – Rational Functions



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Multiply or divide (remember to factor when necessary).

Keep  
Change  
Flip \*

9.  $\frac{x+3}{5x+20} \cdot \frac{x^2+3x+2}{x^2+5x+6}$

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

$\boxed{\frac{x+1}{5(x+4)}} \text{ OR } \boxed{\frac{x+1}{5x+20}}$

10.  $\frac{x^2-x-12}{4x+12} \div \frac{x^2-6x+8}{6}$

$\frac{(\cancel{x-4})(\cancel{x+3})}{4(\cancel{x+3})} \cdot \frac{\cancel{6}^3}{(\cancel{x-4})(x-2)}$

$\boxed{\frac{3}{2(x-2)}} \text{ OR } \boxed{\frac{3}{2x-4}}$

11.  $\frac{15x^2}{45x^3} \div \frac{5x^6}{9x^4}$

$\frac{\cancel{3}^3 \cancel{5}^1 x^2}{\cancel{4}^4 \cancel{5}^5 x^3} \cdot \frac{\cancel{9}^1 x^4}{\cancel{5}^5 x^6}$

$\frac{3x^6}{5x^7} = \boxed{\frac{3}{5x}}$

12.  $\frac{6x+24}{5x-35} \cdot \frac{9x-63}{7x+28}$

$\frac{6(\cancel{x+4})}{5(\cancel{x-7})} \cdot \frac{9(\cancel{x-7})}{7(\cancel{x+4})}$

$\boxed{\frac{54}{35}}$