

# WARMUP

Reduce each fraction

$$1) \frac{15}{24} = \frac{\cancel{3} \cdot 5}{\cancel{3} \cdot 8} = \frac{5}{8}$$

$$4) \frac{\cancel{1} \cdot (x+3)}{(\cancel{x+3})(x+8)} = \frac{1}{x+8}$$

$$2) \frac{65}{5} = \frac{13 \cdot \cancel{5}}{\cancel{5}} = 13$$

$$5) \frac{x^2-9}{x-3} = \frac{(x+3)(\cancel{x-3})}{1 \cdot \cancel{x-3}} = x+3$$

$$3) \frac{11}{121} = \frac{\cancel{11}}{\cancel{11} \cdot 11} = \frac{1}{11}$$

What does  $\frac{b-a}{a-b}$  equal?  $-1$

$$\frac{100-2}{2-100} = \frac{98}{-98} = -1$$

$$\frac{-1-0}{0-(-1)} = \frac{-1}{1} = -1$$

## Section 7.1 Rational Expressions (fractions that have variables)

What  $x$ -values make each expression undefined?

ex:  $\frac{6x+12}{7x-28}$

set bottom = 0

$$7x-28=0$$

$$7x=28 \Rightarrow x=4$$

$$\frac{2x+6}{x^2+3x-10}$$

set bottom = 0

$$x^2+3x-10=0$$

$$\begin{array}{c} -10 \\ 5 \times -2 \\ 3 \end{array}$$

$$(x+5)(x-2) = 0$$

$$x+5=0 \quad x-2=0$$

$$x = -5 \quad x = 2$$

ex: Simplify  $\frac{5x+35}{20x} = \frac{\cancel{5}(x+7)}{\cancel{5} \cdot 4x} = \frac{x+7}{4x}$

Steps to simplify:

- 1) Factor numerator and denominator completely
- 2) Cancel common factors.

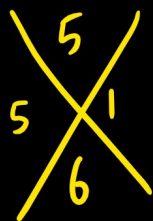
ex:  $\frac{7x+28}{21x} = \frac{\cancel{7}(x+4)}{\cancel{7} \cdot 3x} = \frac{x+4}{3x}$

ex:  $\frac{x^3+x^2}{x+1} = \frac{x^2(\cancel{x+1})}{\cancel{x+1}} = \frac{x^2}{1} = x^2$

ex:  $\frac{x^3-x^2}{7x-7} = \frac{x^2(\cancel{x-1})}{7(\cancel{x-1})} = \frac{x^2}{7}$

$$\text{ex: } \frac{x^2 + 6x + 5}{x^2 - 25} = \frac{\cancel{(x+5)}(x+1)}{\cancel{(x+5)}(x-5)} = \frac{x+1}{x-5}$$

Tip:



$$\text{ex: } \frac{x^2 - 1}{x^2 + 3x + 2} = \frac{\cancel{(x+1)}(x-1)}{\cancel{(x+1)}(x+2)} = \frac{x-1}{x+2}$$

$$\frac{a-b}{b-a} = -1 \quad \frac{5-15x}{9x-3} = \frac{5\cancel{(1-3x)}^{-1}}{3\cancel{(3x-1)}} = -\frac{5}{3}$$

$$\frac{(3x)^2 - 7^2}{7-3x} = \frac{\cancel{(3x-7)}^{-1}(3x+7)}{\cancel{7-3x}} = -(3x+7)$$

or  
-3x-7

Assignment: p469 5, 6, 25-70 multiples of 5