

Warm-up:

1) $x^2 + 2x$

2) $x^5 + 6x^4$

3) $x^2 + 4x + 4$ *Factors of 4*
 $(x+2)(x+2)$

1	4
2	2

4) $2x^2 - 50$

5) $x^3 + 8$

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ACT Question of the Day

4. Given $f = cd^3$, $f = 450$, and $d = 10$, what is c ?

F. 0.45

G. 4.5

H. 15

J. 45

K. 150

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Unit 1 ~ Rationals & Radicals

Objective: A.APR.6

Day 8: Simplifying Rationals

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Steps:

- 1) Factor the numerator & denominator. *on the top*
on the bottom.
- 2) Cancel common factors.
- 3) Find restrictions.

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Example 1:

Simplify: $\frac{5x^3y}{15xy^3}$

$$\begin{aligned} & \frac{5}{5} \cdot \frac{x^3}{x} \cdot \frac{y^1}{y^3} \\ & \frac{1}{3} \cdot \frac{x^2}{1} \cdot \frac{y^{-2}}{1} \\ & \frac{1}{3} \cdot \frac{x^2}{1} \cdot \frac{1}{y^2} = \boxed{\frac{x^2}{3y^2}} \end{aligned}$$

State any restrictions. $y \neq 0$

Your Turn:

Simplify: $\frac{25x^4y^2}{5x^2y^5}$

$$\begin{aligned} & \frac{25}{5} \cdot \frac{x^4}{x^2} \cdot \frac{y^2}{y^5} \\ & \frac{5}{1} \cdot \frac{x^2}{1} \cdot \frac{y^{-3}}{1} = \frac{5}{1} \cdot \frac{x^2}{1} \cdot \frac{1}{y^3} = \boxed{\frac{5x^2}{y^3}} \end{aligned}$$

State any restrictions. $y \neq 0$

Example 2:

Simplify: $\frac{x^2 + 7x + 10}{x^2 - 3x - 10}$

num: $\begin{matrix} 10 \\ 2 \times 5 \\ 7 \end{matrix}$ Denom: $\begin{matrix} 10 \\ 2 \times -5 \\ -3 \end{matrix}$

factors of 10: $\begin{matrix} 2, 5 \\ 10, 1 \end{matrix}$

$$= \frac{(x+2)(x+5)}{(x+2)(x-5)} = \boxed{\frac{x+5}{x-5}}$$
$$\begin{aligned} x-5 &= 0 \\ +5 &+5 \\ x &= 5 \end{aligned}$$

State any restrictions. $x \neq 5$

Your Turn:

Simplify: $\frac{x^2 + 2x - 8}{x^2 - 5x + 6}$

num: $\begin{matrix} -8 \\ -2 \times 4 \\ 2 \end{matrix}$ Denom: $\begin{matrix} 6 \\ -2 \times -3 \\ -5 \end{matrix}$

$$= \frac{(x-2)(x+4)}{(x-2)(x-3)} = \boxed{\frac{x+4}{x-3}}$$
$$\begin{aligned} x-3 &= 0 \\ +3 &+3 \\ x &= 3 \end{aligned}$$

State any restrictions. $x \neq 3$

Example 3:

Simplify: $\frac{2x^2 - 3x - 2}{2x^2 - 8}$

num: $(2x^2 - 4x) + (x - 2)$
 $2x(x - 2) + 1(x - 2)$
 $(2x + 1)(x - 2)$

Denom: $2(x^2 - 4)$
 $2(x + 2)(x - 2)$

$\frac{(2x + 1)(x - 2)}{2(x + 2)(x - 2)}$
 $\frac{2x + 1}{2(x + 2)}$

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

State any restrictions. $x \neq -2$

Example 4:

Simplify: $-\frac{(49 - z^2)}{z + 7}$

$-\frac{49 + z^2}{z + 7} = \frac{z^2 - 49}{z + 7} = \frac{(z + 7)(z - 7)}{(z + 7)}$
 $= z - 7$

$z^2 - 49$
 $x = \sqrt{z^2} = z$
 $y = \sqrt{49} = 7$
 $(z + 7)(z - 7)$

State any restrictions. None



Lesson Check

Do you know HOW?

Simplify each rational expression. State any restrictions on the variables.

1. $\frac{4z - 12}{8z + 24}$

2. $\frac{3x - 3}{x^2 - x}$



