

Honors Algebra II

Notes Section 5A

Multiply and Divide Rational Expressions

EXAMPLE 1 Simplify.

a) $\frac{x^2 - 2x - 15}{x^2 - 9}$ _____

b) $\frac{x^2 - 8x + 16}{x^2 + 2x - 24}$ _____

EXAMPLE 2 A company makes a tin to hold flavored popcorn. The tin is a rectangular prism with a square base. The company is designing a new tin with the same base and twice the height of the old tin.



a) Find the surface area and volume for each tin.

b) Calculate the ration of the surface area to the volume for each tin.

c) What do the ratios tell you about the efficiencies of the 2 tins?

EXAMPLE 3 Simplify.

$$\text{a) } \frac{8x^3y \cdot 7x^4y^3}{2xy^2 \cdot 4y}$$

$$\text{b) } \frac{5x^2y^3 \cdot 27x^5}{3xy^4 \cdot 15x^4y}$$

EXAMPLE 4 Multiply.

$$\text{a) } \frac{3x - 3x^2}{x^2 + 4x - 5} \cdot \frac{x^2 + x - 20}{3x}$$

$$\text{b) } \frac{20x - 5x^2}{x^2 - x} \cdot \frac{x^2 + 3x - 4}{x^2 - 16}$$

EXAMPLE 5 Multiply.

$$\text{a) } \frac{x + 2}{x^3 - 27} \cdot x^2 + 3x + 9$$

$$\text{b) } \frac{x - 4}{x^3 + 8} \cdot x^2 - 2x + 4$$

EXAMPLE 6 Divide.

$$a) \frac{7x}{2x - 10} \div \frac{x^2 - 6x}{x^2 - 11x + 30} \quad \text{-----}$$

$$b) \frac{x^2 - 4x - 21}{5x + 15} \div \frac{x^2 + 3x - 70}{x^2 - 100} \quad \text{-----}$$

EXAMPLE 7 Divide.

$$a) \frac{6x^2 + x - 15}{4x^2} \div 3x^2 + 5x \quad \text{-----}$$

$$b) \frac{3x^2 + 13x - 10}{6x^2} \div 3x^2 - 2x \quad \text{-----}$$