

Chapter 8.4: Multiplying and Dividing Rational Expressions

Factor, Factor, Factor...

do the operation

$$\frac{2}{3} \cdot \frac{1}{4} = \frac{2}{12} = \frac{1}{6}$$

$$\frac{2}{3} \div \frac{1}{4} = \frac{2}{3} \cdot \frac{4}{1} = \frac{8}{3}$$

ex. $\frac{x^2 - 2x - 15}{x^2 - 9}$

$$\frac{(x-5)\cancel{(x+3)}}{\cancel{(x+3)}(x-3)} = \frac{x-5}{x-3}$$

A company makes a tin to hold 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.

- Find the surface area and volume of each tin
- Calculate the ratio of surface area to volume for each tin.
- What do the ratios tell you about the efficiencies of the two tins.

ex. Simplify:

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

$$\frac{\cancel{8}x^{\cancel{3}2}\cancel{y}}{\cancel{2}x\cancel{y}^2\cancel{4}y} \cdot \frac{7x^4\cancel{y}^3}{\cancel{4}y} = \frac{56x^7y^4}{8xy^3}$$

$$= \boxed{7x^6y}$$

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ex. Multiply $\frac{3x - 3x^2}{x^2 + 4x - 5} \bullet \frac{x^2 + x - 20}{3x}$

$$\frac{x+2}{x^3-27} \bullet (x^2+3x+9)$$

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

$$\frac{7x}{2(x-5)} \cdot \frac{x(x-6)}{(x-5)(x-6)}$$

$$x \neq 5, 6, 0$$

$$\frac{\cancel{7x}}{2\cancel{(x-5)}} \cdot \frac{\cancel{(x-5)}\cancel{(x-6)}}{\cancel{x}\cancel{(x-6)}} = \left(\frac{7}{2}\right)$$

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

$$\frac{6x^2 + x - 15}{4x^2} \div \frac{3x^2 + 5x}{1}$$

$$\frac{90}{9 \overline{) 10}} \cdot \frac{(3x+5)(2x-3)}{4x^2} \cdot \frac{1}{x(3x+5)}$$

$$\frac{2x-3}{4x^3}$$

Homework: Ch 8.4 pg.577 #'s
8,12,14,24,30,32,34,38,42