

## Squaring a Binomial

p 431

$$\text{EX: } (x+3)^2 = (x+3)(x+3)$$

$$x^2 + \underline{3x + 3x} + 9$$

$$x^2 + 6x + 9$$

$$(3x+4)^2 = (3x+4)(3x+4)$$

$$9x^2 + \underline{12x + 12x} + 16$$

$$9x^2 + 24x + 16$$

## 5.6 Exponent Rules and Dividing Polynomials

### Quotient Rule

$$\text{EX: } x^2 \cdot x^6 = x^8$$

$$\frac{x^6}{x^2} = \frac{\overset{|}{x} \cdot \overset{|}{x} \cdot \overset{|}{x} \cdot \overset{|}{x} \cdot \overset{|}{x} \cdot \overset{|}{x}}{\underset{|}{x} \cdot \underset{|}{x}} = \frac{x^4}{1} = x^4$$

$$\frac{x^8}{x^2} = x^{8-2} = x^6$$

$$\frac{x^5}{x^3} = x^{5-3} = x^2$$

$$\frac{x^4}{x} = x^{4-1} = x^3$$

$$\frac{x^3}{x^3} = 1$$

$$\frac{6}{6} = 1$$

$$\frac{12}{12} = 1$$

$$\frac{x^3}{x^3} = x^{3-3} = x^0$$

$$\frac{2376}{2376} = 1$$

$$\frac{0}{0} =$$

$$\frac{x^3}{x^3} = 1$$

undefined

Def:  $x^0 = 1, x \neq 0$

EX:

$$x^6 \cdot x^0 = x^6$$

Rem:  $\frac{x^6}{x^2} = x^4$        $\frac{x^2}{x^6} = x^{2-6} = x^{-4}$

$\frac{x^2}{x^6} = \frac{\cancel{x} \cdot \cancel{x}}{x \cdot \cancel{x} \cdot x \cdot x \cdot x \cdot x} = \frac{1}{x^4}$

$\frac{x^{10}}{1} \cdot \frac{1}{x^4} = \frac{x^{10}}{x^4} = x^{10-4} = x^6$

$x^{10} \cdot x^{-4} = x^{10+(-4)} = x^6$

Def:  $x^{-n} = \frac{1}{x^n}$

Note:

$$\frac{3x^{-2}y^3}{z^4w^{-3}}$$

is an unacceptable

final answer

Simplify

$$\frac{1}{x^{-3}}$$

=

$$\frac{1}{x^3}$$

=

$$\frac{1}{1} \cdot \frac{x^3}{1} = x^3$$

$$\frac{3x^{-2}y^3}{z^4w^{-3}}$$

=

$$\frac{3y^3w^3}{x^2z^4}$$

Ex:

$$\frac{4x^{-1}y^3z^{-3}}{3w^{-2}u^4v} = \frac{4y^3w^2}{3xz^3u^4v}$$

## Dividing a Polynomial by a Monomial

$$\frac{6x^6 + 8x^5 - 12x^2}{2x^2}$$

$$\frac{6x^6}{2x^2} + \frac{8x^5}{2x^2} - \frac{12x^2}{2x^2}$$

$$3x^4 + 4x^3 - 6$$

$$\frac{18x^5 - 12x^4 + 9x^3 - 3x^2}{3x^2}$$

$$6x^3 - 4x^2 + 3x - 1$$

## **Exponent Rules (p 444)**

**p 445**

**p 454**

**p 458**