

# 11/13/12 Dividing Polynomials.

We can divide polynomials in a similar way to dividing using long division

**Divide**

**Example 1**

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

$$\frac{4x^5 + 4x^2 - 2x - 2}{2x^2 + 1}$$

Ans:  $2x^3 - x + 2 + \frac{-x - 4}{2x^2 + 1}$

1) Make sure both the numerator and denominator are in descending order w/ no missing terms.

$$\begin{array}{r} x-6 \\ x+2 \overline{) x^2 - 4x + 3} \\ \underline{-x^2 + 2x} \phantom{+ 3} \\ -6x + 3 \\ \underline{+6x + 12} \\ 15 \end{array}$$

Ans:  $x - 6 + \frac{15}{x+2}$

$$\begin{array}{r} 2x^3 - x + 2 \\ 2x^2 + 1 \overline{) 4x^5 + 0x^4 + 0x^3 + 4x^2 - 2x - 2} \\ \underline{-4x^5 + 2x^3} \phantom{+ 4x^2 - 2x - 2} \\ -2x^3 + 4x^2 - 2x - 2 \\ \underline{+2x^3 + 2x^2 + x} \phantom{- 2} \\ 4x^2 - x - 2 \\ \underline{-4x^2 + 4x + 2} \\ -x - 4 \end{array}$$

2) If some terms are missing, put in 0 placeholders.

$$\frac{4t^4 - 2t^3 - 3t - 9}{2t^2 - t - 3}$$

Ans:  $2t^2 + 3$

3) Divide

$$\begin{array}{r} 2t^2 + 3 \\ 2t^2 - t - 3 \overline{) 4t^4 - 2t^3 + 0t^2 - 3t - 9} \\ \underline{-4t^4 + 2t^3 + 6t^2} \phantom{- 9} \\ 6t^2 - 3t - 9 \\ \underline{-6t^2 + 6t + 9} \\ 0 \end{array}$$

4) In your final answer, be sure to write your remainder over your divisor.