

Bellwork:

Find using synthetic division.

$$f\left(-\frac{1}{2}\right) = 2x^4 - 6x^2 + 10x - 2$$

$$\begin{array}{r|rrrrr}
 -\frac{1}{2} & 2 & 0 & -6 & 10 & -2 \\
 & & -1 & \frac{1}{2} & 2.75 & -6.375 \\
 \hline
 & 2 & -1 & -5.5 & 12.75 & -8.375
 \end{array}$$

Chapter 5.3: Add, Subtract, Multiply Polynomials

- Remember like terms.....
- And FOIL...

ex. add $2x^3 - 5x^2 + 3x - 9$ and $x^3 + 6x^2 + 11$

$$\begin{array}{r}
 2x^3 - 5x^2 + 3x - 9 + (x^3 + 6x^2 + 11) \\
 3x^3 + x^2 + 3x + 2
 \end{array}$$

$$\begin{array}{r}
 2x^3 - 5x^2 + 3x - 9 \\
 + \quad x^3 \quad 6x^2 \quad 11 \\
 \hline
 3x^3 + 1x^2 + 3x + 2
 \end{array}$$

ex. Subtract $5z^2 - z + 3$ from $4z^2 + 9z - 12$

$$\begin{array}{r}
 4z^2 + 9z - 12 - (5z^2 - z + 3) \\
 -1z^2 + 10z - 15
 \end{array}$$

$$\begin{array}{r}
 4z^2 + 9z - 12 \\
 - (5z^2 - z + 3) \\
 \hline
 -1z^2 + 10z - 15
 \end{array}$$

ex. Multiply $x+3$ and $3x^2-2x+4$

$$\begin{array}{l}
 (x+3)(3x^2-2x+4) \\
 \hline
 3x^3 - 2x^2 + 4x + 9x^2 - 6x + 12 \\
 \hline
 3x^3 + 7x^2 - 2x + 12
 \end{array}$$

$$\begin{array}{r}
 3x^2 - 2x + 4 \\
 \times \quad x + 3 \\
 \hline
 9x^2 - 6x + 12 \\
 3x^3 - 2x^2 + 4x + 0 \\
 \hline
 3x^3 + 7x^2 - 2x + 12
 \end{array}$$

ex. Multiply $x-5$, $x+1$ and $x+3$

$$\begin{array}{l}
 (x-5)(x+1)(x+3) \\
 (x-5)(x^2+3x+x+3) \\
 (x-5)(x^2+4x+3) \\
 \hline
 x^3 + 4x^2 + 3x - 5x^2 - 20x - 15 \\
 \hline
 x^3 - 1x^2 - 17x - 15
 \end{array}$$

Special Patterns: pg.247 in text

$$(a+b)(a-b) = a^2 - b^2$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$(a-b)^2 = a^2 - 2ab + b^2$$

$$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$(a-b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$$

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

ex. a. $(3t+4)(3t-4) \rightarrow \frac{(3t)^2 - 4^2}{9t^2 - 16}$

b. $(8x-3)^2 \rightarrow 64x^2 - 48x + 9$

c. $(pq+5)^3$

$$(pq)^3 + 3(5)^2(pq) + 3(5)(pq)^2 + 5^3$$

$$p^3q^3 + 75pq + 15p^2q^2 + 125$$

ex. Since 1980, the number W (in thousands) of US wells producing crude oil and the average daily oil output well O (in barrels) can be modeled by(below) where t is the number of years since 1980. Write a model for the average total amount T of crude oil produced per day. What was the average total amount of crude oil produced per day in 2000?

$$W = -0.575t^2 + 10.9t + 548 \quad O = -0.249t + 15.4$$

Homework: Chapter 5.3 pg. 349
#'s 7-12,16-24e,28,36,38-40,50