

## Quest Review WS 6.3-6.4

1. Be able to add/subtract polynomials. Put answers in standard form.

a)  $(9x^2 + x - 2) + (-5x^2 - 2x + 8)$

$$\boxed{4x^2 - x + 6}$$

b)  $(3x^2 - 8x + 2) - (7x^2 - 3x - 5)$

$$3x^2 - 8x + 2 - 7x^2 + 3x + 5$$

$$\boxed{-4x^2 - 5x + 7}$$

c)  $(x^3 - 2x^2 + 1) + 2(x^3 - 5x^2 + 4x + 8)$

$$x^3 - 2x^2 + 1 + 2x^3 - 10x^2 + 8x + 16$$

$$\boxed{3x^3 - 12x^2 + 8x + 17}$$

2. Be able to multiply polynomials. Put answers in standard form.

a)  $(2x + 7)^2$

$$(2x + 7)(2x + 7)$$

$$\boxed{4x^2 + 28x + 49}$$

b)  $(2x^2 + 4x - 3)(x - 3)$

$$2x^3 - 6x^2 + 4x^2 - 12x - 3x + 9$$

$$\boxed{2x^3 - 2x^2 - 15x + 9}$$

c)  $[(x + 6)(x - 1)](x + 2)$

$$(x^2 + 5x - 6)(x + 2)$$

$$x^3 + 2x^2 + 5x^2 + 10x - 6x - 12$$

$$\boxed{x^3 + 7x^2 + 4x - 12}$$

d)  $(x + 2)^3$

$$[(x + 2)(x + 2)](x + 2)$$

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

$$x^3 + 2x^2 + 4x^2 + 8x + 4x + 8$$

$$\boxed{x^3 + 6x^2 + 12x + 8}$$

3. Be able to divide polynomials. Write answers in standard form.

a)  $(x^3 - 5x^2 + 4x - 3) \div (x + 1)$

$$\begin{array}{r}
 x^2 - 6x + 10 - \frac{13}{x+1} \\
 x+1 \overline{) x^3 - 5x^2 + 4x - 3} \\
 \underline{-(x^3 + x^2)} \quad \downarrow \\
 0 - 6x^2 + 4x - 3 \\
 \underline{+(+6x^2 + 6x)} \quad \downarrow \\
 0 + 10x - 3 \\
 \underline{-(10x + 10)} \\
 0 - 13
 \end{array}$$

b)  $(x^2 - x - 20) \div (x - 5)$

$$\begin{array}{r}
 x + 4 \\
 x-5 \overline{) x^2 - x - 20} \\
 \underline{+(x^2 + 5x)} \quad \downarrow \\
 0 + 4x - 20 \\
 \underline{-(4x - 20)} \\
 0 + 0
 \end{array}$$

4. Be able to use polynomial models to solve real-life problems.

For 1990 through 1996, you can model the number of bachelor degrees  $D$  earned by people in the United States and the number of bachelor degrees  $W$  earned by women in the United States by:

$$D = 12829.86t + 1117893$$

$$W = 9777.82t + 602005.12$$

where  $t$  is the number of years since 1990.

a) Find a model that represents the number of bachelor degrees  $M$  earned by men in the United States from 1990 through 1996.

$$m = D - W \rightarrow (12829.86t + 1117893) - (9777.82t + 602005.12)$$

$$m = 3052.04t + 515887.88$$

b) Find the total number of bachelor degrees earned in 1993.

$$1993 \rightarrow t = 3$$

$$m = 3052.04(3) + 515887.88$$

$$= 525,044 \text{ bachelor degrees}$$