Unit 2: Polynomial, Power, and Rational Functions
HW Packet #2 – Due 11/3/14

For questions 1-4, sketch a graph of the function showing all extrema and x-intercepts. Describe the end behavior using limits.

1.) $f(x) = (x - 2)^2(x + 1)(x - 3)$

2.) $f(x) = (2x + 1)(x - 4)^3$

3.) $f(x) = 2x^4 - 5x^3 - 17x^2 + 14x + 41$

4.) $f(x) = -3x^4 - 5x^3 + 15x^2 - 5x + 19$

For questions 5-8, find the zeros of the function algebraically.

5.) $f(x) = 9x^2 - 3x - 2$

6.) $f(x) = x^3 - 25x$

7.) $f(x) = 3x^3 - x^2 - 2x$

8.) $f(x) = 5x^3 - 5x^2 - 10x$

For questions 9-10, state the degree and list the zeros of the polynomial. Indicate if the function crosses the x-axis at each zero, or only touches the axis at that point.

9.) $f(x) = (x - 1)^3 (x + 2)^2$

10.) $f(x) = 7(x - 3)^2 (x + 5)^4$

For questions 11-14, write a function with the given zeros. Sketch the resulting function.

11.) $2, 7, -3$

12.) $\frac{1}{2}, \frac{2}{3}, -4, 0$

13.) $\sqrt{5}, -\sqrt{5}, -\frac{3}{2}$

14.) $3, 7, -\frac{1}{3}, \frac{1}{3}, 2$

15.) Dixie Packaging Co. has contracted to manufacture a box with no top that is to be made by removing squares of width *x* from the corners of a 15-inch by 60-inch piece of cardboard.

      a.) Write a formula for V in terms of x.

      b.) Determine x so that the volume of the box is at least 450 cubic inches.

16.) Squares of width of x are removed from a 10-cm by 25-cm piece of cardboard, and the resulting edges are folded up to form a box with no top. Determine all values of x so that the volume of the resulting box is at most 175 cubic cm.