Name_____

Precalculus Unit 2: 2.2 Homework
Polynomial Functions of Higher Degree

1. Use the Leading Coefficient Test to determine the end behavior of the function $f(x) = \frac{1}{3}x^3 + 5x$.

2. Use the Leading Coefficient Test to determine the end behavior of the function $f(x) = \frac{-3}{4}x^4 - \frac{1}{2}x + 5$.

3. Find all real zeros of the function $g(t) = t^2 - 6t + 9$ by factoring and give the multiplicity of each root.

   Zero: Multiplicity:

4. Find all real zeros of the function $f(x) = 2x^2 - 14x + 24$ by factoring and give the multiplicity of each root.

   Zero: Multiplicity:

   Zero: Multiplicity:

5. Find all real zeros of the function $h(p) = \frac{5}{3}p^2 + \frac{8}{3}p - \frac{4}{3}$ by factoring and give the multiplicity of each root.

   Zero: Multiplicity:

   Zero: Multiplicity:

6. Find all real zeros of the function $f(x) = x^5 + x^3 - 6x$ by factoring and give the multiplicity of each root.

   Zero: Multiplicity:

   Zero: Multiplicity:

   Zero: Multiplicity:

7. Find all real zeros of the function $f(x) = 4x^3 + 4x^2 - 7x - 7$ by factoring and give the multiplicity of each root.

Zero: Multiplicity:

Zero: Multiplicity:

Zero: Multiplicity:

8. Use your calculator to graph the function $g(x) = \frac{-3}{8}x^4 - x^3 + 2x^2 + 5$ and find the zeros and extrema (maxima and minima).

Zeros:

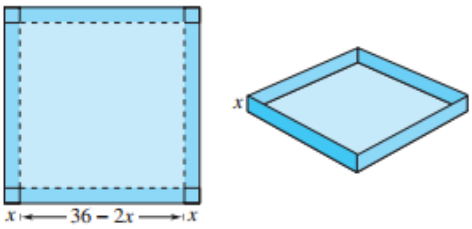
Maxima:

Minima:

9. Find a polynomial function that has the following zeros – put your function in standard form:

$x = 0, x = -2, x = 3, and\ x = 7$

10. An open box (no lid) is to be made from a square piece of material that is 36 centimeters on each side by cutting equal squares of side length *x* from the corners and folding up the sides (see figure).



a. Write a function that gives the volume of the box in terms of *x*. (Remember that volume of a rectangular prism is length · width · height.)

b. What is the domain of $V(x)$? (What are possible values of *x*?)

c. Use your calculator to find the value of *x* that produces a box with the maximum volume.