

Lab 3 Chapter 3

Please show all work in the space provided for credit.

1.) The equation $y = -657.095x^2 + 2859.214x + 12109.167$ models the sales of RV's (recreational vehicles) in millions of dollars (y) from 2003 to 2009. "x" is the number of years past 2003. (y=1,234 means \$1,234,000,000)

a.) Algebraically, find the year in which the sales for RV's was at its maximum. Use $x = -b/2a$ formula. Show work.

Find the year: _____

b.) What were the maximum RV sales in that year? (Notice units) \$ _____

2. For $g(x) = 3x^2 - 12x + 6$, answer the following questions.

a. Find the x-intercepts. Show work.

b. State the coordinates of the y-intercept. _____

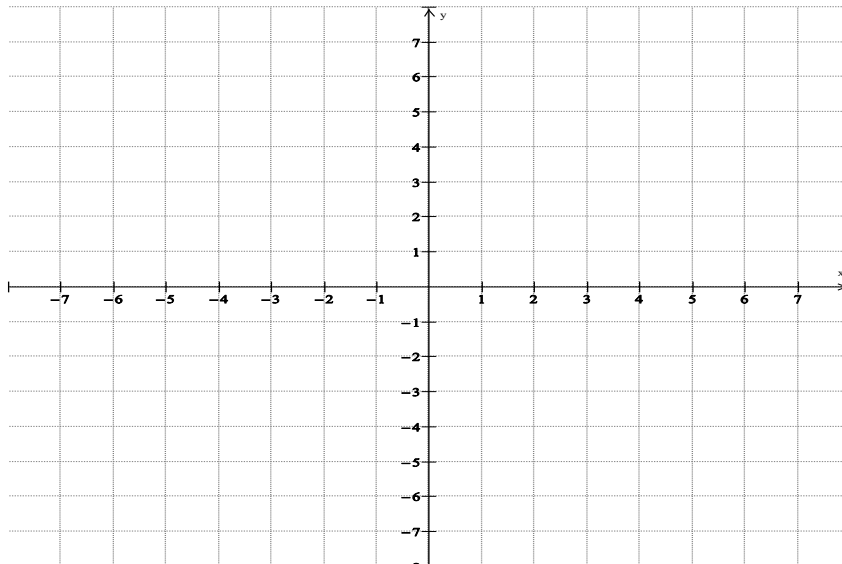
c. State the vertex. _____

d. State the axis of symmetry. _____

e. State the direction of the parabola (opening up or down) _____

f. Decide whether there is a relative maximum or minimum, then state it. _____

g. Graph the function accurately using the above information.



3. Given a cubic polynomial function $p(x) = ax^3 + bx^2 + cx + d$, ($a, b, c, d \neq 0$), answer the following questions. Justify each answer.

- a. How many x-intercepts can there be? _____
- b. Does the degree of this polynomial function guarantee any x-intercepts? _____
- c. Will the graph pass through the origin? _____
- d. Could the graph “touch” the x-axis in two different places? _____
- e. Identify the end behavior of the graph. _____
- f. If it is known that one zero is real and another zero is imaginary, what can be determined about the remaining zeros?

4.) The function $f(x) = \frac{6.5x^2 - 20.4x + 234}{x^2 + 36}$ models the pH level, $f(x)$ of the human mouth x minutes after a person eats food containing sugar.

a. Determine to the nearest tenth the pH level of the human mouth 42 minutes after a person eats food containing sugar.

b. What is the equation of the horizontal asymptote associated with this function?

5.) For the function $f(x) = 6x^4 - 41x^3 + 78x^2 - 9x - 54$,

- a. State the degree of the polynomial. _____
- b. Use the Rational Zero Theorem to list all of the possible rational zeros.
- c. Use a graphing calculator to determine which numbers in the list of possible rational zeros are probable rational zeros (indicated by the x-intercepts of the graph).

The graph appears to cross the x-axis at how many x-intercepts? _____
The graph appears to touch the x-axis at how many x-intercepts? _____
- d. Use synthetic division and then other algebraic methods to find all the zeros.

Zeros: