Algebra II: Chapter 6 Unit Test – Calculator Active Name: _____

Write answers in the space provided. Round all decimals to 3 places.

1. Use the following data to answer questions (a) – (e).

Time (sec)	Height (m)
0	1.03754
0.108	1.40205
0.215	1.63806
0.3225	1.77412
0.43	1.80392
0.5375	1.71522
0.645	1.50942
0.7525	1.21410
0.86	0.83173

a) Write the quadratic regression equation for this data:

b) Write the value of r^2:

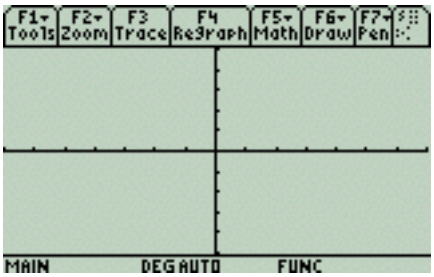
c) Is this equation an excellent fit for the data? Explain in one sentence.

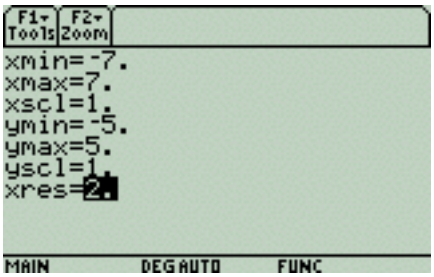
d) Use the regression equation to predict the value of y when $x = -1$:

e) Use the regression equation to predict the value of x when $y = 2$:

2. Given the cubic polynomial $y = -2x^3 + 4x^2 - x + 1$,

a) sketch the function and copy the graph in the grid provided. Use the window dimensions given.





b) What are the x – intercepts and y – intercepts of the function?

c) What are the coordinates of the maximum point?

d) What are the coordinates of the minimum point?

e) Sketch the function $y = 4x - 3$ as well as the cubic. Do not copy the graph on the grid. What are the coordinates of the point(s) of intersection of the two graphs?

3. a) Factor $2x^4 - x^3 - 13x^2 - x - 15$.

b) How many roots do you expect a quartic equation to have?

b) Solve $2x^4 - x^3 - 13x^2 - x - 15 = 0$ for all of its real and complex roots.

4. Determine the quotient and remainder of $\frac{2x^3 - x}{x + 3}$ (use the calculator!).

Quotient: Remainder:

5. Expand: $\left(x - 2 - \sqrt{3}\right)\left(x - 2 + \sqrt{3}\right)$:

6. Write the equation for a <u>CUBIC</u> polynomial that has the following roots:

	Factored Form	Expanded Form
a) $x = 1$, $x = 2$, and $x = -3$		
b) $x = -1$ (multiplicity 3)		
c) $x = 2$ and $x = 2 + \sqrt{3}$		
d) $x = 2$ and $x = 1 + i$		