Project 1

**Varies from student to student**

**Course: MAT-110**

Name

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Due Date

October 31, 2014

Instructor: Dr. Valluru

1. The function models the median height, in inches of girls who are *x* months of age.
2. Describe how the graph can be obtained using transformations of the square root function and draw the graph.
3. According to the model, what is the median height of girls who are 48 months, or four years, old? Use a calculator and round to the nearest tenth of an inch. The actual median height for girls at 48 months is 40.2 inches. How well does the model describe the actual height?
4. Use the model to find the average rate of change, in inches per month, between birth and 10 months. Round to the nearest tenth.
5. Use the model to find the average rate of rate, in inches per month, between 50 and 60 months. Round to the nearest tenth. How does this compare with your answer in part (c)? How is this difference shown by the graph?
6. You have \_\_\_\_\_ feet of fencing to enclose a rectangular plot that borders on a river. If you do not have fence the side along the river, find the length and width of the plot that will maximize the area. What is the largest area that can be enclosed?
7. a) Use synthetic division to show that 4 is a solution of the polynomial equation

b) Use the solution from part (a) to solve this problem. The number of eggs, in a female moth is a function of her abdominal width, *x*, in millimeters, modeled by

What is the abdominal width when there are 594 eggs?

1. The rational function

models the number of arrests, per 100,000 drivers, for driving under the influence of alcohol, as a function of a driver’s age, *x*.

1. Graph the function in a [0, 70, 5] by [0, 400, 20] viewing rectangle.
2. Describe the trend shown by the graph.
3. Use the ZOOM and TRACE features of the maximum function feature of your graphing utility to find the age that corresponds to the greatest number of arrests. How many arrests, per 100,000 drivers, are there for this age group?
4. A ball is thrown vertically upward from the top of the Leaning Tower of Pisa (192 feet high) with an initial velocity of \_\_\_\_ feet per second. During which time period will the ball’s height exceed that of the tower?

192 feet

