Homework #2

Write up carefully your solutions to these problems on a seperate piece of paper.. They will be due on Friday, August 31.

1. a. Sketch the graph ofthe height of a basketball from the time it leaves the shooter's hands from where he is standing just beyond the three-point line, until it swishes through the net. Your y-axis is the height of the ball and the x-axis will be distance from the rim.
b. Which common function could be used to model this situtation?
c. Sketch a graph of the velocity of the ball.

2. Sketch a graph of the polynomials p, given below. Show the endpoint (large x) behavior and explain how the powers change the behavior at the roots.

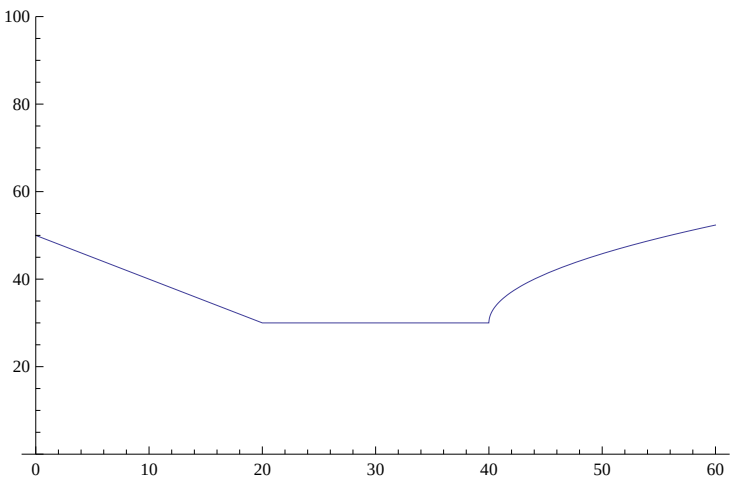
a. p(x)= $x^3 - 8x^2 + 21x - 18 = (x-3)^2(x+2)$
b. p(x) = $(x-3)^3(x+2)^2$(x+6)

3. A line intecepts the parabola $y = 2x^2 + 1$ at two points- when x=-1 and x=2. Find the equation of this line.

4. The amount of trash (in tons) entering a local landfill as a function of time (in months) can be approximated by a straight line with a slope 7/4. In May the dump received 3,546 tons of trash. How much trash should they anticipate receiving next January? (I'll be more-impressed if you can show me how to do this without finding the equation of the line.)

5. Make up a story that would explain the motion given by the following graph:

Out[19]=



6. Write a piecewise equation that would give the graph above. (You will need to approximate. Using a graphing calculator to check your answer is almost a necessity.)

7. a. Fill in the following table to find the (approximate) instantaneous velocity of an object moving with distance from the origin given by s(t) = $3t^2 - 4t + 11$ feet when time t = 5.

second time	4	4.5	4.99	5.05	5.5	6
average velocity	□	□	□	□	□	□

(Redraw the table and fill in the second row.)

b. From the table, what do you think the instantaneous velocity is when t=5?

c. Find the exact instantaneous velocity by taking the limit of a difference quotient.