Student ID		

Last Name: _____

First Name: _____

Show all your work.
If necessary, use extra sheets.

When appropriate,
BOX your final answer.

M$5
Homework
35

1. The height of an object, h(t), is determined by the formula $h(t) = -16t^2 + 256t$, where t is time, in seconds. Will the object reach a maximum or a minimum? Determine what the maximum or minimum height will be.	2. The height, h, in feet, a ball will reach when thrown in the air is a function of time, t, in seconds, given by the equation $h(t) = -16t^2 + 30t + 6$. Find, to the *nearest tenth*, the maximum height, in feet, the ball will reach.
3. Write a quadratic equation with integral coefficients that has the root $\frac{5-4i}{6}$.	4. Find the inverse of the function $2x + 3y = 6$.
5. A software company agrees to write a program for \$5000 plus \$75 for each copy. Express the total cost, C(x), as a function of the number of copies, x.	6. What is the axis of symmetry of the parabola represented by the equation $y = 2x^2 + 16x - 11$?
7. If $f(x) = 2x + 1$ and $g(x) = 6$, find $(f \circ g)(x)$.	8. If $r(x) = 5 - 2x^2$ and $t(x) = x - 3$, find $(r \circ t)(x)$ in simplest form.

9. Montana and her brother Edward were racing remote control cars. The speed of Montana's car is represented by the equation $s(t) = 25t^2 - 32$, where t represents the time in seconds. The speed of Edward's car is represented by the equation $s(t) = 7t^2 + 15t$. How many seconds, to the *nearest tenth* of a second, does it take for the speed of two cars to be equal? [Only an algebraic solution will be accepted.]

10. An archer shoots an arrow into the air such that its height at any time, t, is given by the function $h(t) = -16x^2 + kt + 3$. If the maximum height of the arrow occurs at time $t = 4$, what is the value of k?

11. Given $r(x) = 5 - x^2$ and $t(x) = 3 - x$, express each of the following in *simplest form*.
    a. $(r \circ t)(x)$
    b. $(t \circ t)(x)$

12. Determine algebraically whether $f(x) = -\frac{1}{2}x + 6$ and $g(x) = -2x - 6$ are inverses of each other.
    [*Hint*: Remember that two functions f and g are inverses of each other when $(f \circ g)(x) = (g \circ f)(x) = x$.]