Math 152 Ch. 11 Sample Test Name_____
Show all your work if you want to receive credit.

1. Solve using completing the square: $x^2 - 10x - 1 = 0$.
2. Solve using any method
   (a) $3x^2 - 7x - 1 = 0$
   (b) $\left(\frac{x-2}{x+3}\right)^2 - 4\left(\frac{x-2}{x+3}\right) - 21 = 0$
   (c) $x^4 - 6x^2 + 5 = 0$
3. Solve the inequality $x^2 - 8x + 12 > 0$. The answer should be written in interval notation.
4. The solutions of a quadratic equation are given. Find the quadratic equation.
   (a) only 7
   (b) 2 and -4
   (c) $2 + 3i$ and $2 - 3i$
5. The current in a river is 4 mph. In order for the barge to travel 24 miles upriver and then return in a total of 5 hours, approximately how fast must the barge be able to travel in still water?
6. Solve $N = \frac{k^2 - 4k}{2}$ for k.
7. Find the vertex of $y = 3x^2 - 6x + 2$.
8. Given $y = 2x^2 - 4x - 12$, find the x and y intercepts (if they exist).
9. The revenue function for a company is $R(x) = 1000x - x^2$ and the cost function is $C(x) = 3000 + 2x$. Find the x value that gives maximum profit and the value of the maximum profit.
10. An orange grower find that she gets an average yield of 60 bushels per tree when she plants 20 trees per acre. Each time she adds one tree per acre, the yield per tree decreases by 2 bushels per tree. How many trees per acre should she plant for maximum yield?