Spring '04/MAT 140/Exam 2 **Name:** *Show all your work.*

Solve the following equations:

1. (2pts) $2(x+4)-4=3x-5$

2. (3pts) Solve for t: $A=P(1+rt)$

3. (4pts) The line 3x+2y=5 is given.
a) Find the x- and y-intercepts of the line.
b) Sketch the line in a coordinate system.

4. (4pts) Find the equation of the line that contains $(-1,3)$ and is parallel to the line $4x-2y=5$.

5. (4pts) Verify that the triangle whose vertices are $A = (-6, 3)$, $B = (3, -5)$ and $C = (-1, 5)$ is a right triangle.

Solve the following equations:

6. (4pts) $x^2 + 2x - 3 = x - 2$

7. (5pts) $x - 3 = \sqrt{24 - 4x}$

8. (4pts) Find the equation of the circle that is tangent to both x- and y-axes, has radius 3 and lies in the fourth quadrant. Sketch the circle.

9. (5pts) The equation $y = x^5 - 4x^2 + 3$ is given.
a) Use your calculator to accurately sketch the graph of the equation on paper. Indicate your viewing window.
b) Find the greatest x-intercept accurate to two decimal points. What is the y-intercept?

10. (4pts) Solve the equation by completing the square: $x^2 - 8x + 6 = 0$

11. (6pts) How many milliliters of a 20% solution of sulphuric acid needs to be added to 100ml of pure water in order to get a 15% solution? Don't forget to write down what your variable means.

12. (5pts) Alonso has \$100,000. He can invest in a B-rated bond that pays 12% per year and a Certificate of Deposit that pays 7% per year. How much should be invested in each to realize interest of \$10,000 per year? Don't forget to write down what your variable means.

Bonus (5pts) Solve: $x^6 + 3x^3 - 40 = 0$.