Math 80
Final Exam
March 19th, 2009

Name: _____

1. Your exam contains 10 questions and 7 pages; Please make sure you have a complete exam.
2. The entire exam is worth 100 points. Point values vary and these are indicated on each problem. You have 2 hours for this exam.
3. Make sure to **ALWAYS SHOW YOUR WORK**. If in doubt, ask for clarification.
4. If you need extra space, use the back of the exam and clearly indicate this.
5. You are allowed one 8.5" $\times$ 11" notesheet for handwritten notes (one side only).
6. Simplify answers as much as possible.
7. Put a box around your final answer where applicable.

Problem	Total Points	Score
1	17	
2	10	
3	10	
4	8	
5	8	
6	11	
7	4	
8	14	
9	9	
10	8	
Total	100	

1. (17 pts.) Simplify the following as much as possible. Carry out operations ($+$, $-$, $\times$, $\div$) where needed.

(a) (2 pts.) $\frac{5}{12} + \frac{5}{4}$

(b) (2 pts.) $-\sqrt{\frac{4}{25}}$

(c) (3 pts.) $\sqrt{72}$

(d) (3 pts.) $(2.7x^3 - 2x + 3.1) - (x^3 - 7x + 8.2)$

(e) (4 pts.) $(2m + 7)(3m - 1)$

(f) (3 pts.) $11xy(2x^2 + y + 5)$

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2. (10 pts.) Solve the following equations.

(a) (5 pts.) $\frac{x}{5} = \frac{x}{3} - 2$

#2 Continued on next page

#2 Continued:

(b) (5 pts.) $3(t-2)+6t-10=2$

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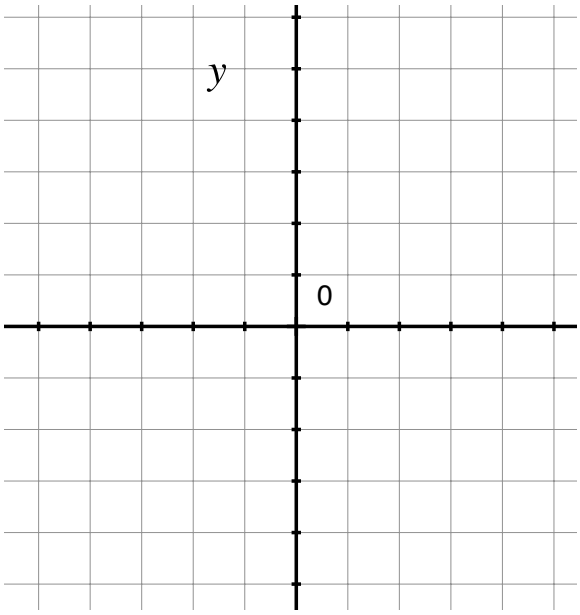
3. (10 pts.) Solve each of the systems below by using substitution **or** elimination.

(a) (5 pts.) $\begin{cases} 4a+3b=-1 \\ 6a-2b=5 \end{cases}$

(b) (5 pts.) $\begin{cases} -3x+4y=6 \\ x=2 \end{cases}$

4. (8 pts.) Solve the following system **by graphing**. Be sure to **check** your solution and **put a scale** on your graph.

$$\begin{cases} y = x - 1 \\ -6x + 2y = 2 \end{cases}$$



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5. (8 pts.) Find an equation of a line through the points $(5, 0)$ and $(-7, -3)$.

   Write your final answer in slope-intercept form.

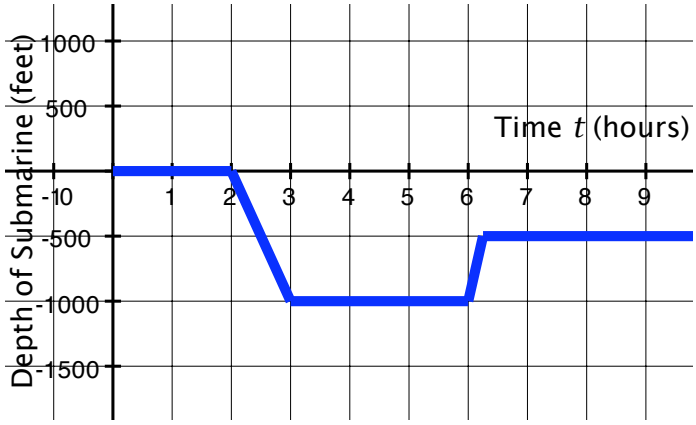
6. (11 pts.) **Factor** the following as much as possible.

(a) (4 pts.) $-x^3 - 5x^2 + 24x$

(b) (4 pts.) $3y^2 - 14y + 8$

(c) (pts.) $25a^2 - b^2$

7. (4 pts.) The depth (in feet) of a submarine t hours after leaving port is shown in the graph below.



(a) (2 pts.) What is the depth of the submarine 2.5 hours after leaving port? (Include units.)

(b) (2 pts.) How long does the submarine travel at a depth of 1000 feet? (Include units.)

8. (14 pts.) Solve the following equations **using the method specified**. Simplify your answers as much as possible.

   (a) (4 pts.) Solve $4x^2 = 64$ by factoring **or** by using the square root property.

   (b) (5 pts.) Solve $x^2 - 8x - 2 = 0$ by completing the square.

   (c) (5 pts.) Solve $2x^2 - 3x = 1$ by using the quadratic formula. Approximate the solutions to the nearest hundredth (Two decimal places).

9. (9 pts.) On a beautiful day, you decide to walk and jog along a trail. You jog at a speed of 5 mph and you walk at a speed of 3 mph.

   You spent **6 hours total** on the trail and you traveled a **total of 22 miles**. (Wow!!)
   How long did you spend walking and how long did you spend jogging? (Use an equation or equations to solve. Write your answer in a complete sentence.)

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10. (9 pts.) The hypotenuse of a right triangle has an unknown length x. Leg 1 is **2 inches shorter** than the hypotenuse. Leg 2 is **4 inches shorter** than the hypotenuse. (See below.)

    Find the lengths of the sides of the triangle. (Write an equation to solve.)