Find all real or imaginary solutions in #s 1 – 4.

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

2. (5 pts) $\dfrac{1}{12}x+\dfrac{2}{5}=\dfrac{3}{10}$

3. (5 pts) $5x^2=9$

4. (5 pts) $4x^2-8x-1=0$ (Leave your final answer in simplified radical form.)

5. (10 pts) Compute the discriminant for each of the following quadratic equations and tell me what it tells you about the solutions of the equations, *without having to solve them*, i.e., don't solve.

   a. $4x^2-8x-3=0$ b. $3x^2-10x+14=0$

6. (10 pts) Solve $x^2+6x-23=0$ by completing the square.

7. (5 pts) Find an equation of the line through $(-2,11)$ and $(5,23)$.   Point-slope is preferred, but not required.

8. Find an equation of the line thru $(3,5)$ that is

   a. (5 pts) … *parallel* to the line $y=7x-11$.

   b. (5 pts) … *perpendicular* to the line $y=7x-11$.

9. (5 pts each) Sketch the graph of the line. Include intercepts.

   a. $x=50$ b. $y=39$ c. $2x+3y=18$

Solve the inequalities. Give you answer as a set and as an interval. You may want to use a number line graph to help you write your answer, but it is not required.

10. (5 pts) $5x+4<11x+7$ 12. (5 pts) $|2x+9|\geq 11$

11. (5 pts) $|2x+9|<11$ 13. (5 pts) $|2x+9|\geq -11$

Define variables, units and write the equation(s) to *set up* the problem, but don't go all the way and solve it.

14. (5 pts) How much 20% nitrate solution must be added to a 50% nitrate solution to obtain 50 liters of 41% nitrate solution?

15. (5 pts) John can do a job in 6 hours that takes Bob 10 hours. Suppose John comes in 2 hours early on the day they were to work together. How many hours does Bob end up working, if they work together from the time he arrives? How many hours does John end up working that day?

BONUS Follow-up (5 pts) To the nearest minute, what time of day is it when John and Bob finish the job, if John got there at 6:00 a.m., the day they worked together?

NEXT PAGE OF TEST IS BONUS!!!   DON'T MISS IT!!!

BONUS Section (10 pts) Answer *two* of the following for up to 10 points.

1. Give the center and radius of the circle. This will involve completing the square to obtain Standard Form. Then sketch it: $x^2 + y^2 + 14x - 6y = -33$.

2. Solve by completing the square: $9x^2 - 30x + 42 = 0$. Give the *exact* answer, in simplified radical form.

3. Solve the radical equation: $\sqrt{x+2} + \sqrt{3x+10} = 2$. Give the *exact* answer.

4. Solve the quadratic equation, $1.2x^2 - 3.155x - 1.682 = 0$. Round your final answer to 4 places.