Problems PreCal 1508 PLTL Workshop, October 12, 2011
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Please do the problems that you feel will help your group the most first (you don't have to do them in order). All handouts are available at `http://alex.knaust.info/pltlfall2011/`

1. Determine whether each ordered pair is a solution to the system of equations

2. $$\begin{cases} -\log x + 3 = y \\ \frac{1}{9} + y = \frac{28}{9} \end{cases}$$

   a $(1, 3)$ b $(10, 2)$ c $(9, \frac{37}{9})$

3. Solve the following systems, algebraically, if they can't be solved algebraically solve them graphically

   a) $\begin{cases} x - y = -1 \\ x^2 - y = -4 \end{cases}$ b) $\begin{cases} 3x - 5y = 7 \\ 2x + y = 9 \end{cases}$ c) $\begin{cases} x + 2z = 5 \\ 3x - y - z = 1 \\ 6x - y + 5z = 16 \end{cases}$

   d) $\begin{cases} xe^x = 1 \\ x + 2y = 4 \end{cases}$ e) $\begin{cases} y = -x \\ y = x^3 + 3x^2 + 2x \end{cases}$ f) $\begin{cases} 3\alpha - 3\beta + 6\gamma = 6 \\ \alpha + 2\beta - \gamma = 5 \\ 5\alpha - 8\beta + 13\gamma = 7 \end{cases}$

4. Describe, geometrically, the possible solutions for a system of two equations.

5. Find a system of linear equations that has the pair $(3, 1)$ as a solution. (There are many correct answers)

6. Let f be a *one-to-one* function (with a known inverse function f^{-1}). How would you go about solving for x in
   $$3 \cdot f\left(\frac{x}{2}\right) - 5 = 7$$

7. Discuss with your group : When solving a system of linear equations do you decide what to do intuitively or do you follow a methodology?

8. Find all values of x that satisfy the equation : $\log_2(2x - 3) = \log_4(x + 1)$

9. Describe, geometrically, the possible solutions for a system of three equations.

10. How much more work is solving a system of three equations than solving a system of two equations? Does it take one more operation? Twice as many? Three times as many?