Discussion – Friday, Aug 26

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1. Draw graphs of the following:
   a) $2x + y = 2$ b) $x + 2y = -1$
   Where do they intersect?
   i) use the graph ii) check by solving system
2. What are all the possible kinds of intersections between two lines in the plane?
3. Draw a graph of
   a) $x + 2y + 3z = 6$ b) $z = 0$
   c) $x = y$
   What is the intersection of a&b? of a,b,&c?
4. What are all the possible kinds of intersections of two planes in 3D? of three planes? (Draw sketches to illustrate.)
5. Come up with a system of equations in two variables with exactly
   a) 0 solutions b) 1 solution c) ∞ solutions
6. Do the same but with 3 variables.
7. Can a system have exactly two solutions?
8. Solve

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

   Describe the solutions geometrically.
9. What are solutions to the system of 3 variables and zero equations?