Econ 101 Discussion Section-Handout 1

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1 Problems

1. Line A and Line B are both straight lines. The points (0, 10) and (10, 20) lie on Line A. The points (5, 20) and (15, 5) lie on Line B.

   (a) Draw Line A and Line B on a graph.

      i. Solved in dis

   (b) Find the slope of each line.

      i. $m_A = 1$
      ii. $m_B = -\frac{3}{2}$

   (c) Write the equations of Line A and Line B in slope-intercept form. (OK to leave things as fractions).

      i. $y_A = x + 10$
      ii. $y_B = -\frac{2}{3}x + \frac{55}{2}$

   (d) What is the point of intersection between Line A and Line B?

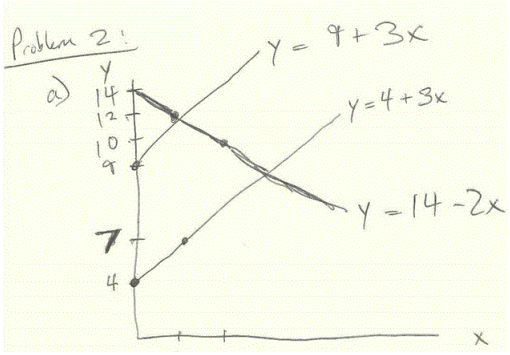
      i. $(7, 17)$

2. Graph the line given by the equation y = 4 + 3x, with y on the vertical axis.

   (a) What is the slope of this line? Are x and y positively or negatively related?

      i. Positive

   (b) On the same graph, graph the line given by the equation x = 7 − .5y. (Note the positions of x and y).

      i. 

   (c) What is the slope of this line?

      i. $m = -2$

(d) Write the equation for the line with the same slope as the one in part (a), but with a y-intercept that is 5 units higher. Graph this line along with the others.

i. See first graph

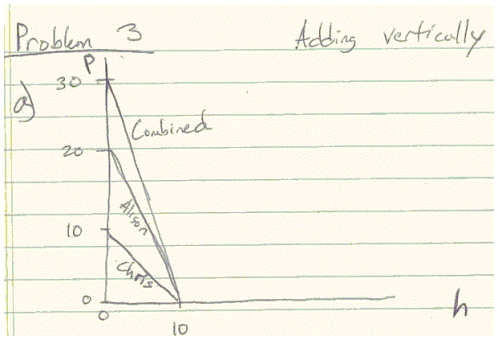
(e) Write the equation for the line with the same slope as the one in part (a), but with an x-intercept that is shifted 1 unit to the right.

i. see first graph

3. Chris and Alison are studying econ practice problems on a Saturday, but also want to spend some time at the terrace. The trade-off they are making is between the number of problems they complete, p, and the number of hours at the terrace, h,

$$\text{Chris } p = -h + 10$$
$$\text{Alison } p = -2h + 10$$

(a) On the same graph, plot the number of problems each of them can do, with p on the vertical axis and h on the horizontal axis

i. 

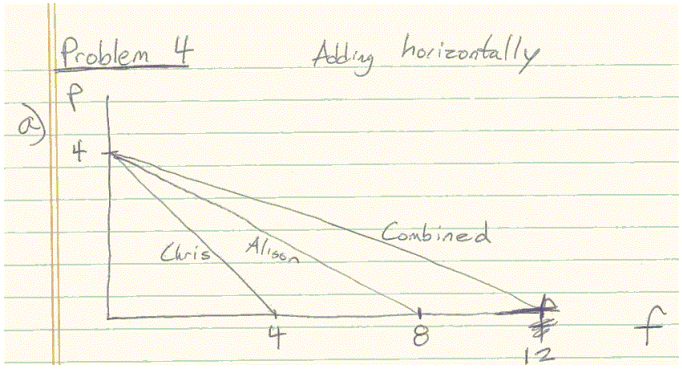
(b) The students want to walk over to the terrace together, so they are going to spend the same number of hours at the terrace, h. How many total problems will they be able to complete? Solve for this equation and graph it with the others

i. Here we have fixed the same $h_{crhis} = h_{alison}$, then we just have to add them vertically. $P_{chris} = -h + 10$, $P_{allison} = -h + 10$, so $p_{total} = p_{chris} + p_{alison}$. Hence $p_{total} = -3h + 30$. See first graph

4. Now it is Sunday, and Chris and Alison have to complete a set number of chemistry homework problems, p, which limits the number of football games, f, that they can watch

$$\text{Chris } p = -f + 4$$
$$\text{Alison } p = -\tfrac{1}{2}f + 4$$

(a) On the same graph, plot the number of homework problems they can do, with p on the vertical axis and f on the horizontal axis.

i. 

(b) The assignment is due on Monday, so Chris and Alison both have to complete all the chemistry problems, p, that are assigned. How many football games can they each watch if there are 2 problems on the assignment? What is the equation for the total number of games they can watch? Graph this equation with the others.

   i. Now we want to add them horizontally given that p is fixed. so $p_{chris} = p_{alison}$. then we can rewrite as $f_{chris} = -p + 4$, $f_{alison} = -2p + 8$. So $f_{total} = -3p + 12$. then if there are 2 problesm $f_{total} = -3(2) + 12 = 6$. Therefore $f_{chris} = -2 + 4 = 2$, $f_{alison} = 4$