

Eileen's Work Week

Solving Systems of Inequalities

Calculator instructions

First, make sure the Inequality (Inequalz) Application is running.
Choose <APPS> :Inequalz<ENTER > <ENTER>

Next, go to the Y= screen.

The correct inequality for question 1 is $x + y < 40$. Solve this for y , and you get $y < 40 - x$. Enter this inequality for Y_1 . The correct inequality for question 2 is $15x + 10y > 450$. Solving this for y , you get $y > -1.5x + 45$. Enter this inequality for Y_2 . The correct inequality for question 3 is $y > x$. Enter this inequality for Y_3 .

Choose GRAPH. To view the solution area, choose WINDOW. Set the Xmin and Ymin at 0, and the Xmax and Ymax at 50. Choose GRAPH again. Since it is difficult to see the area of intersection, choose F_2 (ALPHA > WINDOW) > 1:Ineq Intersection > ENTER. This shades only the solution area. To zoom in on this area, make a box and zoom in. Choose ZOOM > Zbox > ENTER. Put the cursor in the top left-hand corner of where you want your box to be. Press ENTER. Arrow down and over to form a box around the area. When the box is complete, press ENTER.

(Note: if you want to use the calculator for question 8, read to those directions* before completing the next sections.)

To answer question 4, use the Point of intersection-Trace. Choose GRAPH. Choose F_4 (ALPHA > TRACE). Use the arrow keys to trace the three points of intersection. $\{(10,30), (18,18), (20,20)\}$.

To answer questions 5 and 6, choose GRAPH. Using the arrow keys, you can move freely through the shaded area. The coordinates of the cursor appear at the bottom of the screen. Coordinate values may be rounded to the nearest integer by the student OR choose MODE > Float > 0 > GRAPH, and the calculator will show only rounded integer values. (Warning: Even though the calculator shows integer values, it does not really store them as integers! Also, don't forget to reset the mode after this activity!)



***Calculator instructions for question 8**

To use the calculator to answer question 8, we refer to the previous sections. When the cursor is on one of the three intersection points, or the one of the three points that you have chosen, choose STO-→. The calculator stores the coordinates into the lists INEQX and INEQY. After pressing STO-→, use the arrow keys to get to your next point, and then press STO-→ again. After you have stored all six points, choose STAT > Edit > ENTER to view your lists. If you arrow down to the points *that you chose in the shaded area*, you will notice that they show in the list as integers, but at the bottom of the screen the actual values are shown. To assure correct solutions to question 8, re-enter each of these coordinates. (Example: type 18 over the 18) Now make a new list to the right of INEQY. Put the cursor in the List title area to the right of INEQY (It should be highlighted black.) Type the name PAY. Press ENTER. This column will record the weekly salary for each combination of hours listed in INEQX and INEQY. As an expression, it would be $15x + 10y$, as a formula it's "15*LINEQX+10*LINEQY". To get the LINEQX and LINEQY for the formula, choose 2nd > LIST then choose the appropriate list. After entering the complete formula, press ENTER. The PAY column show the weekly pay for each ordered pair solution.

OR

If the above process is too confusing, students can just type their coordinates into L1 and L2 and make L3 the PAY list.