

Math 12 – Workshop #7

1. (a) Give the equation for a line which passes through the origin and the point $(2, 7)$.
 (b) Give the equation for a line which passes through the point $(-1, 4)$ and $(0, 6)$.
 (c) At which point (if at all) do these lines intersect?
2. If possible, solve the systems by elimination

(a)
$$\begin{cases} 2x + 3y = 1 \\ x + 3y = 2 \end{cases}$$

(c)
$$\begin{cases} 4x + y = 6 \\ \frac{2}{3}x + \frac{1}{6}y = 1 \end{cases}$$

(b)
$$\begin{cases} \frac{2}{3}x + \frac{1}{2}y = \frac{1}{2} \\ 2x - y = 1 \end{cases}$$

(d)
$$\begin{cases} \frac{1}{x} + \frac{1}{y} = \frac{5}{9} \\ \frac{1}{x} - \frac{1}{y} = \frac{1}{9} \end{cases}$$

3. If possible, solve the following systems using substitution

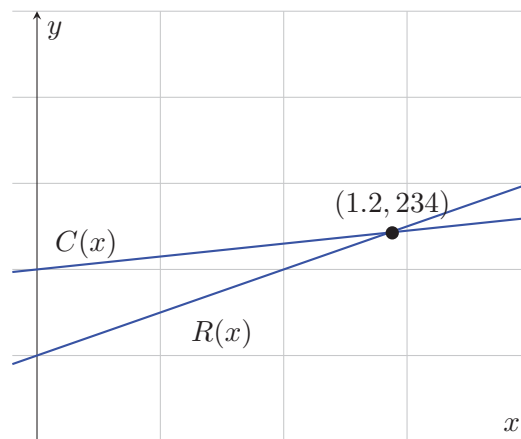
(a)
$$\begin{cases} 2y - 4 = 3x \\ 6x - 4y = -4 \end{cases}$$

(c)
$$\begin{cases} y = \frac{3}{2}x \\ 2x + 3y = 5 \end{cases}$$

(b)
$$\begin{cases} \frac{3}{4}x + \frac{2}{3}y = 7 \\ \frac{3}{5}x - \frac{1}{2}y = 18 \end{cases}$$

(d)
$$\begin{cases} 2x + 3y = 8 \\ 4x + 6y = 16 \end{cases}$$

4. let x be the number of units in thousands. Suppose $C(x)$ is a linear function whose output is the cost of making x units in thousands of dollars and $R(x)$ is a linear function that gives the revenue if x units are sold in thousands of dollars?



- (a) What is the significance of the point shown?
 - (b) Will the production of these items ever turn a profit? Why or why not?
5. A system of two linear equations is formed by the two lines L_1 and L_2 .
 - (a) Suppose the system is only solved by the point $(3, 7)$. What does this tell us about L_1 and L_2 ?
 - (b) Suppose the system isn't solved by any points. What does this tell us about L_1 and L_2 ?
 - (c) Suppose the system is solved by the points $(1, 2)$ and $(4, 9)$. What does this tell us about L_1 and L_2 ?
 6. Solve the inequalities graphically

- (a) $y < 2x$
- (b) $y \geq 3$
- (c) $x - 2y < 1$

7. Which of the following points satisfy the given system of inequalities $\begin{cases} 3x + 2y > 6 \\ x + 3y \leq 2 \end{cases}$

- (a) $(3, 0)$
- (b) $(3, -1)$
- (c) $(4, -3)$
- (d) $(5, -1)$

8. Find the solution set of the system of linear inequalities graphically

- (a) $\begin{cases} x + y > 1 \\ x + y \leq 2 \end{cases}$
- (b) $\begin{cases} 2x - 6y \leq 12 \\ x - 3y < 6 \end{cases}$
- (c) $\begin{cases} 3x + y \leq 1 \\ -x + 2y > 6 \end{cases}$
- (d) $\begin{cases} x^2 - y < 0 \\ y + x^2 < 2 \end{cases}$

9. Create a system of linear inequalities whose solution set is the given region.

