

SOLVING SYSTEMS OF LINEAR INEQUALITIES



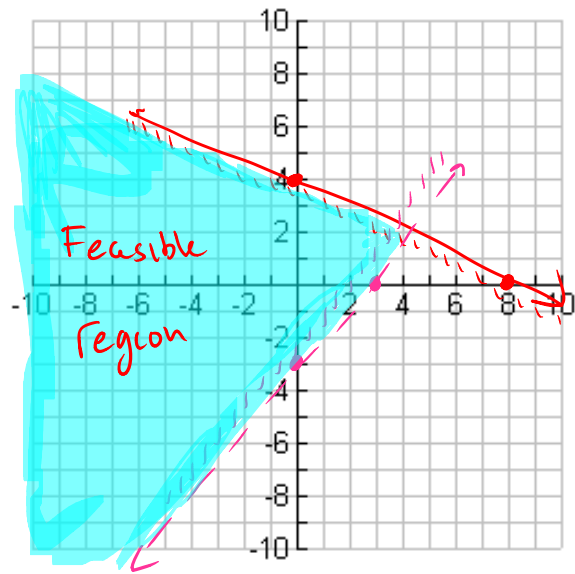
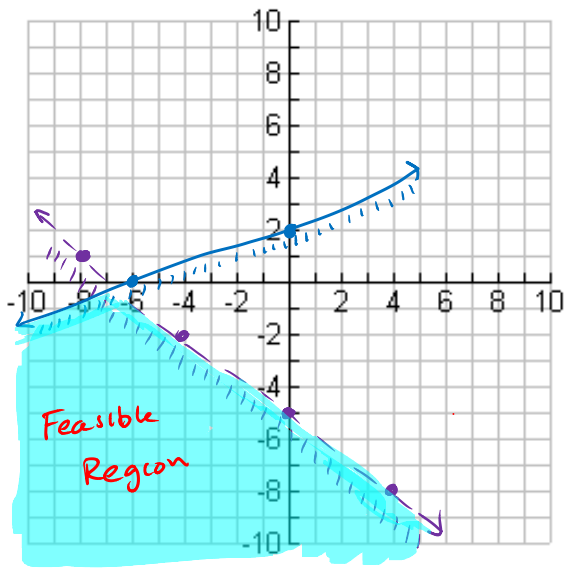
System of linear inequalities: 2 or more inequalities in 2 or more variables

A solution of a system of linear inequalities: any point that satisfies each inequality in the system

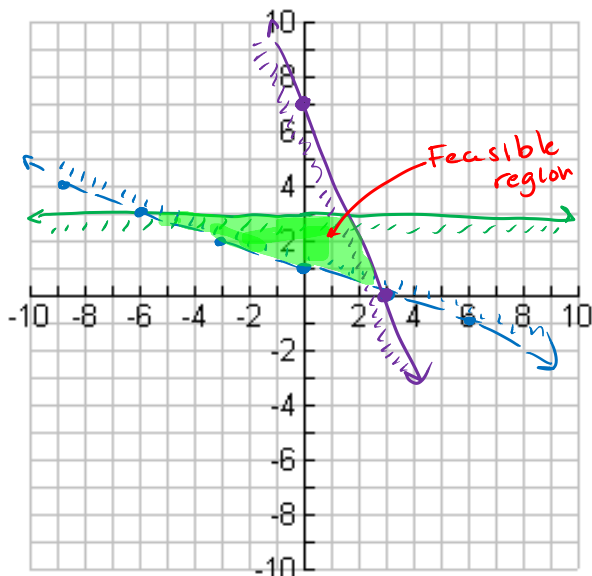
The graph of the system of linear inequalities shows the feasible region of the system.

$$1.) \begin{cases} y < -\frac{3}{4}x - 5 \\ -2x + 6y \leq 12 \end{cases}$$

$$2.) \begin{cases} \frac{x}{4} + \frac{y}{2} \leq 2 \\ -\frac{x}{3} + \frac{y}{3} > -1 \end{cases}$$



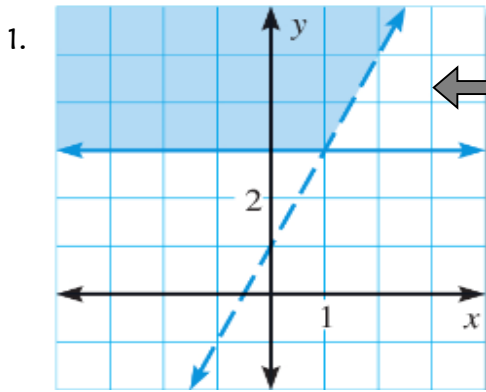
$$3.) \begin{cases} y \leq 3 \\ y > -\frac{1}{3}x + 1 \\ 7x + 3y \leq 21 \end{cases}$$



Determine if the following points are solutions to the system of inequalities.

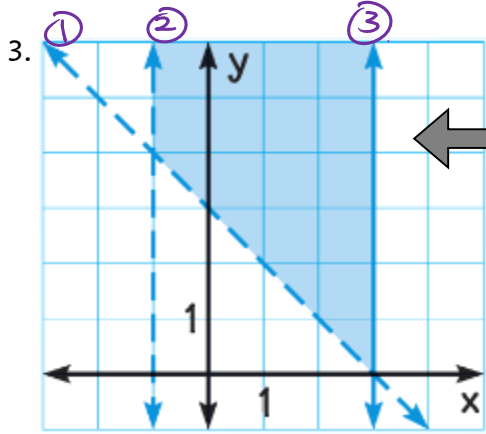
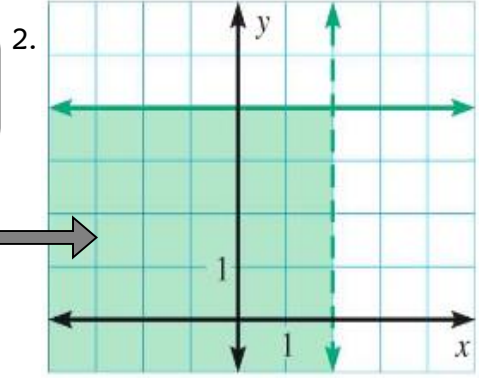
- a.) (1, 7) not a solution
- b.) (3, 0) not a solution
- c.) (-1, 3) solution!

Write a system of inequalities for the shaded region. Give two ordered pairs that ARE solutions, and two that ARE NOT solutions to the system.



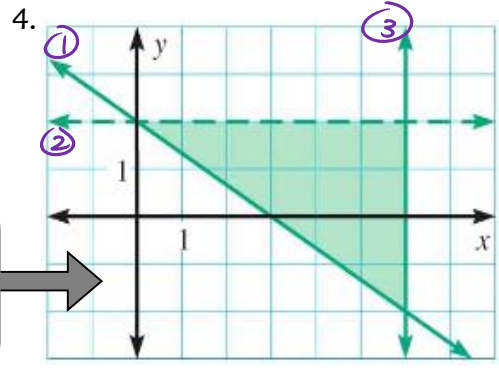
System:
$$\begin{cases} y \geq 3 \\ y < 2x + 1 \end{cases}$$

System:
$$\begin{cases} y \leq 4 \\ x < 2 \end{cases}$$



System:
$$\begin{cases} ① y > -x + 3 \\ ② x > -1 \\ ③ x \leq 3 \end{cases}$$

System:
$$\begin{cases} ① y \geq -\frac{2}{3}x + 2 \\ ② y < 2 \\ ③ x \leq 6 \end{cases}$$



5.) You are taking a test in which items of type A are worth 10 points and items of type B are worth 15 points. It takes 3 minutes for each item of type A and 6 minutes for each item of type B. The total time allowed is 60 minutes, and you may answer ^{no} more than 16 questions.

a.) Define the variables and write a system of linear inequalities.

$x = \# \text{ of type A qs}$
 $y = \# \text{ of type B qs}$

$$\begin{cases} x + y \leq 16 \\ 3x + 6y \leq 60 \end{cases}$$

b.) Graph your solution on the provided grid.

c.) State three combinations of A and B questions that would comply with the above constraints.

Any point that lies within the feasible region, or on the boundary lines.

