

$$\begin{array}{r}
 6 \quad (5x + 3y = 26) \rightarrow 30x + 18y = 156 \\
 5 \quad (6x + 7y = 21) \rightarrow 30x + 35y = 105 \\
 \hline
 -17y = 51 \\
 \frac{-17}{-17} \quad \frac{51}{-17} \\
 y = -3
 \end{array}$$

$$\begin{array}{r}
 \textcircled{\#5} \quad (\leftarrow) \quad \begin{array}{l} x + y = 3 \\ x - 3y = -29 \end{array} \\
 \hline
 \phantom{\textcircled{\#5} \quad (\leftarrow) \quad} \frac{4y = 32}{4} \quad \frac{32}{4} \\
 \phantom{\textcircled{\#5} \quad (\leftarrow) \quad} y = 8
 \end{array}$$

$$\begin{array}{l}
 x + 8 = 3 \\
 x = -5
 \end{array}$$

Inequality Key Words

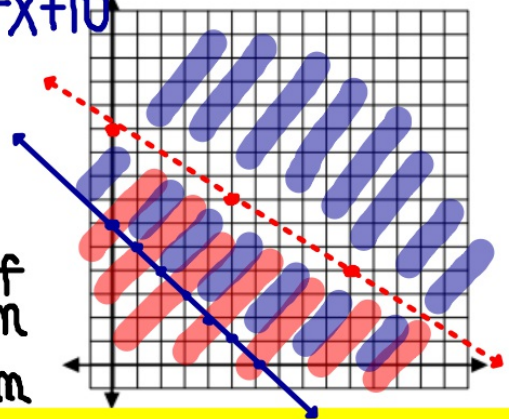
$<$ (less than)	$=$ (equal)	$>$ (greater than)
is less than	is are / will be / only	more than
is under	is the same as	above
is below	that is equal to	over
shorter / smaller than	exactly	greater / larger than
fewer than	half (= .5* or $\frac{1}{2}$ *)	exceeds / increased
is lower than		longer than
beneath		is higher than
a better deal		
\leq (less than or equal to)	\neq (not equal to)	\geq (greater than or equal to)
at most	is not equal to	at least
maximum	is not the same as	minimum
bottom	is different / differs from	top
is no more than		is no less than

System of Inequalities Application

1. Suppose you buy flour and cornmeal in bulk to make flour tortillas and corn tortillas. Flour costs \$1.50 per pound and cornmeal costs \$2.50 per pound. You want to spend less than \$25 on flour and cornmeal, but you need at least 6 pounds altogether.

a. Write and graph a system of linear inequalities:

$$\begin{aligned} 1.50x + 2.50y &< 25 \rightarrow y < -\frac{3}{5}x + 10 \\ x + y &\geq 6 \rightarrow y \geq -x + 6 \end{aligned}$$



b. Write two possible solutions:

- $(7, 2) \rightarrow 7 \text{ lbs of flour} + 2 \text{ lbs of cornmeal}$
- $(9, 3) \rightarrow 9 \text{ lbs of flour} + 3 \text{ lbs of cornmeal}$

X = flour (lbs.)

Y = CORNmeal (lbs.)

$$\begin{aligned} 1.50x + 2.50y &< 25 \\ \underline{-1.50x} & \quad \underline{-1.50x} \\ 2.50y &< -1.50x + 25 \\ \underline{2.50} & \quad \underline{2.50} \quad \underline{2.50} \\ y &< -\frac{3}{5}x + 10 \end{aligned}$$

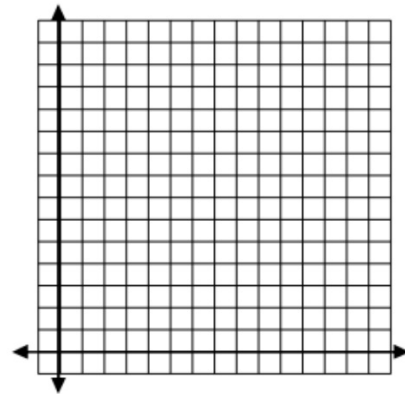
2. A seafood restaurant owner orders perch and salmon. Perch is \$4/lb and salmon is \$3/lb. He wants to buy at least 50 pounds of fish but cannot spend more than \$240.

a. Write and graph a system of linear inequalities:

b. Write two possible solutions:

i. _____

ii. _____



X = _____

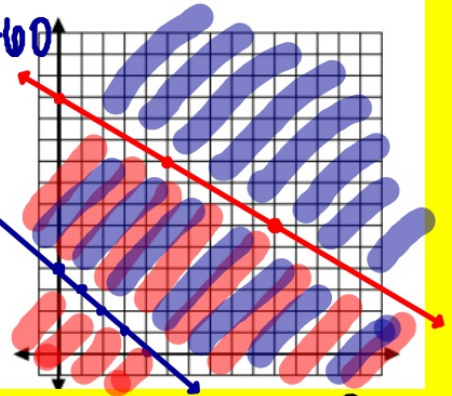
Y = _____

3. The "We Sell CDs" website plans to purchase ads in a local newspaper to advertise their site. Their operating budget will allow them to spend at most \$3000 on this advertising adventure. An ad will cost \$30 to appear in the weekday paper and \$50 to appear in the weekend edition. They plan to run at least 20 ads.

a. Write and graph a system of linear inequalities:

$$30x + 50y \leq 3000 \rightarrow y \leq -\frac{3}{5}x + 60$$

$$x + y \geq 20 \rightarrow y \geq -x + 20$$



b. Write two possible solutions:

- i. $(20, 0) \rightarrow 20$ wkdays + 0 wknds.
- ii. $(25, 1) \rightarrow 25$ wkdays + 1 wknd.

X = Weekday ads

Y = Weekend ads

$$\begin{array}{r} 30x + 50y \leq 3000 \\ -30x \qquad \qquad -30x \\ \hline 50y \leq -30x + 3000 \\ \frac{50y}{50} \leq \frac{-30x}{50} + \frac{3000}{50} \\ y \leq -\frac{3}{5}x + 60 \end{array}$$

6. You'd like to see how many baseball and soccer games you can attend this spring. Travel time for baseball games is 2 hours and soccer games is 1 hour. You would like to spend no more than 15 hours traveling to the games. In total, you would like to attend at least 8 games.

a. Write and graph a system of linear inequalities:

$$2x + y \leq 15 \rightarrow y \leq -2x + 15$$

$$x + y \geq 8 \rightarrow y \geq -x + 8$$

c. Suppose we decide on attending 4 baseball games, what is the range of soccer games you can attend?

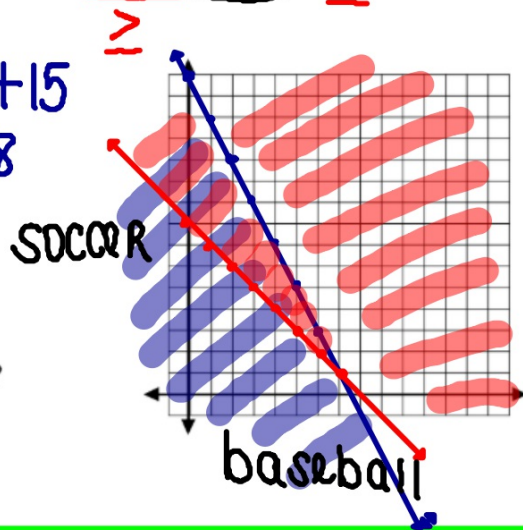
$$4 \leq y \leq 7$$

d. Suppose we decide on attending 9 soccer games, what is the range of baseball games you can attend?

$$0 \leq x \leq 3$$

e. Is it possible to attend 6 baseball games and 4 soccer games?

NO



X = baseball games

Y = SOCCER games