

Systems of Inequalities $<, >, \leq, \geq$ WORD PROBLEMS

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:

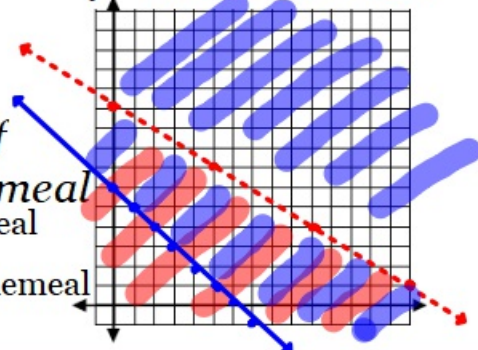
• $1.50x + 2.50y < 25$
 • $x + y \geq 6$

b. Write two possible solutions:

- i. $(1, 7)$ - 1 lb of flour + 7 lbs. of cornmeal
 ii. $(10, 3)$ - 10 lbs. of flour + 3 lbs. of cornmeal

lbs of
cornmeal

$x =$ lbs. of flour
 $y =$ lbs. of cornmeal



lbs. of flour

Word Bank

At least \geq

More than $>$

Less than $<$

At most \leq

Greater than $>$

Minimum \geq

Maximum \leq

$$\begin{aligned} x + y &\geq 6 \\ -x & \quad y - x \\ \hline y &\geq -x + 6 \end{aligned}$$

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

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.

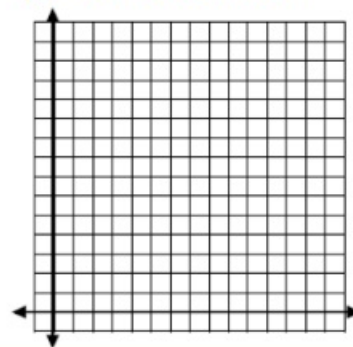
a. Write and graph a system of linear inequalities:

$4x + 3y \leq 240$
 $x + y \geq 50$

b. Write two possible solutions:

- i. _____
 ii. _____

$x =$ lbs. of perch
 $y =$ lbs. of salmon



Word Bank

At least \geq

More than $>$

Less than $<$

At most \leq

Greater than $>$

Minimum \geq

Maximum \leq

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:

$$\begin{aligned} 30x + 50y &\leq 3000 \\ x + y &\geq 20 \end{aligned}$$

b. Write two possible solutions:

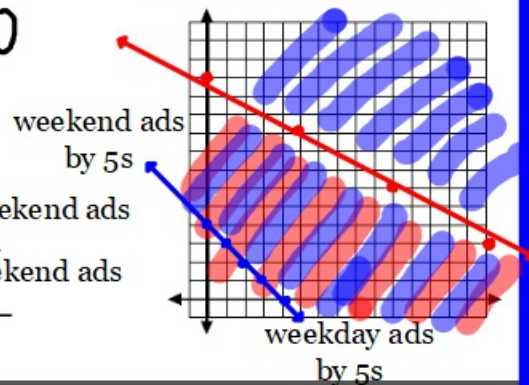
(30, 25) - 30 weekday ads + 25 weekend ads

i. _____

(40, 15) - 40 weekday ads + 15 weekend ads

ii. _____

x = weekday ads
 y = weekend ads



$$\begin{aligned} 30x + 50y &\leq 3000 \\ -30x &\quad -30x \\ \hline 50y &\leq -30x + 3000 \\ \frac{50y}{50} &\leq \frac{-30x}{50} + \frac{3000}{50} \\ y &\leq -\frac{3}{5}x + 60 \end{aligned}$$

$$\begin{aligned} x + y &\geq 20 \\ -x &\quad -x \\ \hline y &\geq -x + 20 \end{aligned}$$

4. Mary knits scarves and sweaters to sell. Scarves take 2 hours to knit and sweaters take 10 hours. Mary would like to spend no more than 40 hours per week knitting and knit at least 5 items per week.

a. Write and graph a system of linear inequalities:

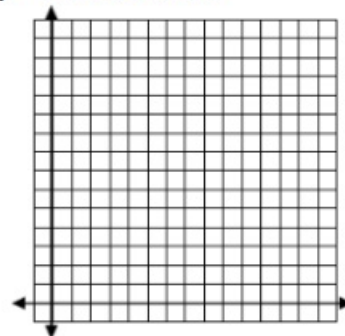
$$\begin{aligned} 2x + 10y &\leq 40 \\ x + y &\geq 5 \end{aligned}$$

b. Write two possible solutions:

i. _____

ii. _____

x = # of scarves
 y = # of sweaters



5. A clothing store has a going-out-of-business sale. They are selling pants for \$8.99 and shirts for \$3.99. You can spend as much as \$60 and want to buy at least two pairs of pants.

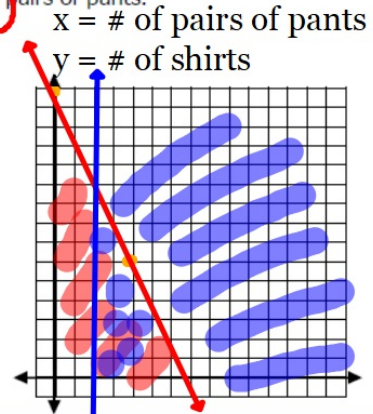
a. Write and graph a system of linear inequalities:

● $8.99x + 3.99y \leq 60$
● $x \geq 2$

b. Write two possible solutions:

i. $(3, 2)$ - 3 pairs of pants + 2 shirts

ii. _____



$$\begin{array}{r}
 9x + 4y \leq 60 \\
 -9x \qquad -9x \\
 \hline
 4y \leq -9x + 60 \\
 \frac{4y}{4} \leq \frac{-9x}{4} + \frac{60}{4} \\
 y \leq -\frac{9}{4}x + 15
 \end{array}$$