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Solving Systems of Inequalities

5 ✓ 2	5 ✓ 3	150	66
1	$5x + 5y \leq 150$		
2	$2x + 3y \leq 66$		

- 1 Write each inequality in slope intercept form.
- 2 Establish the corresponding system of inequalities.
- 3 Determine if the the number of shelves needed could be constructed.
- 4 Identify which graph belongs to which system of inequalities.
- 5 Decide what combinations of comic and fantasy books Caleb could buy.
- + with lots of tips, answer keys, and detailed answer explanations for all of the problems.



The complete package, including all problems, hints, answers, and detailed answer explanations is available for all [sofatutor.com](https://www.sofatutor.com) subscribers.



Write each inequality in slope intercept form.

Choose the correct formulas.

$$(1) \quad 5x + 5y \leq 150$$

$$(2) \quad 2x + 3y \leq 66$$

A

$$(1) \quad y \leq x + 30$$

B

$$(1) \quad y \leq -x + 30$$

C

$$(1) \quad y \leq -x + 150$$

D

$$(2) \quad y \leq -\frac{2}{3}x + 22$$

E

$$(2) \quad y \geq -\frac{2}{3}x + 22$$

F

$$(2) \quad y \leq -\frac{2}{3}x + 66$$



Hints for solving these problems

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of 5

Write each inequality in slope intercept form.

Hint #1

Slope intercept form is given by $y \leq mx + b$, where m is the slope and b the y -intercept.

Hint #2

$$\begin{aligned} 3x + y &\leq 4 \\ y &\leq -3x + 4 \end{aligned}$$

You can subtract from both sides:

Hint #3

Keep in mind: You have to change the relation sign if you multiply or divide by a negative number.



Answers and detailed answer explanations for these problems

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of 5

Write each inequality in slope intercept form.

Answer key: B, D

To get write inequality in slope intercept form, $y \leq mx + b$, we perform the following operations:

$$\begin{aligned} 5x + 5y &\leq 150 \\ -5x &\quad -5x \\ 5y &\leq -5x + 150 \\ \div 5 &\quad \div 5 \\ y &\leq -x + 30 \end{aligned}$$

and

$$\begin{aligned} 2x + 3y &\leq 66 \\ -2x &\quad -2x \\ 3y &\leq -2x + 66 \\ \div 3 &\quad \div 3 \\ y &\leq -\frac{2}{3}x + 22 \end{aligned}$$