

# Solving Problems Involving Systems of Linear Inequalities in Two Variables

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# How to Solve Problems Involving Linear Inequalities in Two Variables?

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2. Write the inequalities that represent the relationships stated in the problem.

# Example 1

Carlos works at a movie theatre selling tickets. The theatre has 300 seats and charges Php 75.00 for adults and Php 55.00 for children. The theatre expects to make at least Php 20,000 for each showing. Write a system of inequalities to model this situation.

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Given:  $300 =$  total number of seats

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Given:

300	=	total number of seats
75	=	cost of each adult ticket



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Given:	300	=	total number of seats
	75	=	cost of each adult ticket
	55	=	cost of each child ticket

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Given:	300	=	total number of seats
	75	=	cost of each adult ticket
	55	=	cost of each child ticket
Let:	$a$	=	number of adult tickets sold

# Example 1

Step 2: Write the inequalities that represent the relationships stated in the problem.

Carlos works at a movie theatre selling tickets. The theatre has 300 seats and charges Php 75.00 for adults and Php 55.00 for children. The theatre expects to make at least Php 20,000 for each showing. Write a system of inequalities to model this situation.

Given:	300	=	total number of seats
	75	=	cost of each adult ticket
	55	=	cost of each child ticket
Let:	$a$	=	number of adult tickets sold
	$c$	=	number of child tickets sold

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Given:	300	=	total number of seats
	75	=	cost of each adult ticket
	55	=	cost of each child ticket
Let:	$a$	=	number of adult tickets sold
	$c$	=	number of child tickets sold
Ineq. 1:	$a + c$	$\leq$	300

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Given:	300	=	total number of seats
	75	=	cost of each adult ticket
	55	=	cost of each child ticket
Let:	$a$	=	number of adult tickets sold
	$c$	=	number of child tickets sold
Ineq. 1:	$a + c$	$\leq$	300
Ineq. 2:	$75a + 55c$	$\geq$	20,000

# Example 1

Therefore, the system of linear inequalities that models this situation is

$$\begin{cases} a + c \leq 300 \\ 75a + 55c \geq 20000 \end{cases}$$

## Example 2

Aiza and Jean want to improve their yards by planting roses and sunflower. The cost of one pot of rose is Php 80 and the cost of one pot of sunflower is Php 120. They do not want to spend more than Php 600 and they want to buy at least 6 plants. Write a system that represents the possible number of roses  $x$ , and sunflower plants  $y$ , that could be sold to meet these conditions.

## Example 2

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Given:  $80 =$  cost of one pot of rose

## Example 2

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Aiza and Jean want to improve their yards by planting roses and sunflower. The cost of one pot of rose is Php 80 and the cost of one pot of sunflower is Php 120. They do not want to spend more than Php 600 and they want to buy at least 6 plants. Write a system that represents the possible number of roses  $x$ , and sunflower plants  $y$ , that could be sold to meet these conditions.

Given:	80	=	cost of one pot of rose
	120	=	cost of one pot of sunflower

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Given:	80	=	cost of one pot of rose
	120	=	cost of one pot of sunflower
Let:	$x$	=	number of roses to buy

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Step 2: Write the inequalities that represent the relationships stated in the problem.

Aiza and Jean want to improve their yards by planting roses and sunflower. The cost of one pot of rose is Php 80 and the cost of one pot of sunflower is Php 120. They do not want to spend more than Php 600 and they want to buy at least 6 plants. Write a system that represents the possible number of roses  $x$ , and sunflower plants  $y$ , that could be sold to meet these conditions.

Given:	80	=	cost of one pot of rose
	120	=	cost of one pot of sunflower
Let:	$x$	=	number of roses to buy
	$y$	=	number of sunflowers to buy

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Given:	80	=	cost of one pot of rose
	120	=	cost of one pot of sunflower
Let:	$x$	=	number of roses to buy
	$y$	=	number of sunflowers to buy
Ineq. 1:	$x + y$	$\geq$	6

# Example 2

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Given:	80	=	cost of one pot of rose
	120	=	cost of one pot of sunflower
Let:	$x$	=	number of roses to buy
	$y$	=	number of sunflowers to buy
Ineq. 1:	$x + y$	$\geq$	6
Ineq. 2:	$80x + 120y$	$\leq$	600

## Example 2

Therefore, the system of linear inequalities that models this situation is

$$\begin{cases} x + y \geq 6 \\ 80x + 120y \leq 600 \end{cases}$$

# Example 3

Cathy is buying plants and soil for her garden. The plant cost Php 100 each and the soil cost Php 40 per bag. She wants to buy at least 5 plants. She cannot spend more than Php 1,000. Write a system of inequalities to model this situation.



# Example 3

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Given:  $100 =$  cost of each plant

# Example 3

Step 1: Understand the problem. Decide what are asked for and what information is given.

Cathy is buying plants and soil for her garden. The plant cost Php 100 each and the soil cost Php 40 per bag. She wants to buy at least 5 plants. She cannot spend more than Php 1,000. Write a system of inequalities to model this situation.

Given:

100	=	cost of each plant
40	=	cost of soil per bag

# Example 3

Step 1: Understand the problem. Decide what are asked for and what information is given.

Cathy is buying plants and soil for her garden. The plant cost Php 100 each and the soil cost Php 40 per bag. She wants to buy at least 5 plants. She cannot spend more than Php 1,000. Write a system of inequalities to model this situation.

Given:	100	=	cost of each plant
	40	=	cost of soil per bag
Let:	$p$	=	number of plants to buy

# Example 3

Step 2: Write the inequalities that represent the relationships stated in the problem.

Cathy is buying plants and soil for her garden. The plant cost Php 100 each and the soil cost Php 40 per bag. She wants to buy at least 5 plants. She cannot spend more than Php 1,000. Write a system of inequalities to model this situation.

Given:	100	=	cost of each plant
	40	=	cost of soil per bag
Let:	$p$	=	number of plants to buy
	$s$	=	number of bags of soil to buy

# Example 3

Step 2: Write the inequalities that represent the relationships stated in the problem.

Cathy is buying plants and soil for her garden. The plant cost Php 100 each and the soil cost Php 40 per bag. She wants to buy at least 5 plants. She cannot spend more than Php 1,000. Write a system of inequalities to model this situation.

Given:	100	=	cost of each plant
	40	=	cost of soil per bag
Let:	$p$	=	number of plants to buy
	$s$	=	number of bags of soil to buy
Ineq. 1:	$p$	$\geq$	5

# Example 3

Step 2: Write the inequalities that represent the relationships stated in the problem.

Cathy is buying plants and soil for her garden. The plant cost Php 100 each and the soil cost Php 40 per bag. She wants to buy at least 5 plants. She cannot spend more than Php 1,000. Write a system of inequalities to model this situation.

Given:	100	=	cost of each plant
	40	=	cost of soil per bag
Let:	$p$	=	number of plants to buy
	$s$	=	number of bags of soil to buy
Ineq. 1:	$p$	$\geq$	5
Ineq. 2:	$100p + 40s$	$\leq$	1000

# Example 3

Therefore, the system of linear inequalities that models this situation is

$$\begin{cases} p \geq 5 \\ 100p + 40s \leq 1000 \end{cases}$$



## Example 4

Mother's weekly budget for pork and chicken is at most Php 1,200. She usually buys at least 3 kilograms of meat weekly. Note that 1 kilogram of chicken costs Php 120 while 1 kilogram of pork costs Php 160. Write a system of inequalities for this situation.

# Example 4

Step 1: Understand the problem. Decide what are asked for and what information is given.

Mother's weekly budget for pork and chicken is at most Php 1,200. She usually buys at least 3 kilograms of meat weekly. Note that 1 kilogram of chicken costs Php 120 while 1 kilogram of pork costs Php 160. Write a system of inequalities for this situation.

# Example 4

Step 1: Understand the problem. Decide what are asked for and what information is given.

Mother's weekly budget for pork and chicken is at most Php 1,200. She usually buys at least 3 kilograms of meat weekly. Note that 1 kilogram of chicken costs Php 120 while 1 kilogram of pork costs Php 160. Write a system of inequalities for this situation.

Given:  $120 =$  cost of chicken per kilo

# Example 4

Step 1: Understand the problem. Decide what are asked for and what information is given.

Mother's weekly budget for pork and chicken is at most Php 1,200. She usually buys at least 3 kilograms of meat weekly. Note that 1 kilogram of chicken costs Php 120 while 1 kilogram of pork costs Php 160. Write a system of inequalities for this situation.

Given:

120	=	cost of chicken per kilo
160	=	cost of pork per kilo

# Example 4

Step 1: Understand the problem. Decide what are asked for and what information is given.

Mother's weekly budget for pork and chicken is at most Php 1,200. She usually buys at least 3 kilograms of meat weekly. Note that 1 kilogram of chicken costs Php 120 while 1 kilogram of pork costs Php 160. Write a system of inequalities for this situation.

Given:	120	=	cost of chicken per kilo
	160	=	cost of pork per kilo
Let:	$c$	=	kilos of chicken to buy

# Example 4

Step 2: Write the inequalities that represent the relationships stated in the problem.

Mother's weekly budget for pork and chicken is at most Php 1,200. She usually buys at least 3 kilograms of meat weekly. Note that 1 kilogram of chicken costs Php 120 while 1 kilogram of pork costs Php 160. Write a system of inequalities for this situation.

Given:	120	=	cost of chicken per kilo
	160	=	cost of pork per kilo
Let:	$c$	=	kilos of chicken to buy
	$p$	=	kilos of pork to buy

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Step 2: Write the inequalities that represent the relationships stated in the problem.

Mother's weekly budget for pork and chicken is at most Php 1,200. She usually buys at least 3 kilograms of meat weekly. Note that 1 kilogram of chicken costs Php 120 while 1 kilogram of pork costs Php 160. Write a system of inequalities for this situation.

Given:	120	=	cost of chicken per kilo
	160	=	cost of pork per kilo
Let:	$c$	=	kilos of chicken to buy
	$p$	=	kilos of pork to buy
Ineq. 1:	$c + p$	$\geq$	3

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Mother's weekly budget for pork and chicken is at most Php 1,200. She usually buys at least 3 kilograms of meat weekly. Note that 1 kilogram of chicken costs Php 120 while 1 kilogram of pork costs Php 160. Write a system of inequalities for this situation.

Given:  $120 =$  cost of chicken per kilo

$160 =$  cost of pork per kilo

Let:  $c =$  kilos of chicken to buy

$p =$  kilos of pork to buy

Ineq. 1:  $c + p \geq 3$

Ineq. 2:  $120c + 160p \leq 1200$



# Example 4

Therefore, the system of linear inequalities that models this situation is

$$\begin{cases} c + p \geq 3 \\ 120c + 160p \leq 1200 \end{cases}$$

**Thank you for watching.**