Solving Problems Involving 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 inequality that represents the relationship stated in the problem.

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1. Understand the problem. Decide what are asked for and what information is given.
2. Write the inequality that represents the relationship stated in the problem.
3. Solve the linear inequality formed.

Example 1

The total amount Cora paid for 2 kilos of beef and 3 kilos of fish is less than Php 700. Suppose a kilo of beef costs Php 250. What could be the maximum cost of a kilo of fish to the nearest pesos?

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The total amount Cora paid for 2 kilos of beef and 3 kilos of fish is less than Php 700. Suppose a kilo of beef costs Php 250. What could be the maximum cost of a kilo of fish to the nearest pesos?

Given: $250 = \text{cost of a kilo of beef}$

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Given:	250	$=$	cost of a kilo of beef
Let:	b	$=$	cost of a kilo of beef

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Given:	250	$=$	cost of a kilo of beef
Let:	b	$=$	cost of a kilo of beef
	f	$=$	cost of a kilo of fish

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Given:	250	$=$	cost of a kilo of beef
Let:	b	$=$	cost of a kilo of beef
	f	$=$	cost of a kilo of fish
Find:			maximum cost of a kilo of fish

Example 1

Step 2: Write the inequality that represents the relationship stated in the problem.

The total amount Cora paid for 2 kilos of beef and 3 kilos of fish is less than Php 700. Suppose a kilo of beef costs Php 250. What could be the maximum cost of a kilo of fish to the nearest pesos?

Given:	250	$=$	cost of a kilo of beef
Let:	b	$=$	cost of a kilo of beef
	f	$=$	cost of a kilo of fish
Find:			maximum cost of a kilo of fish
Inequality:	$2b + 3f$	$<$	700

Example 1

Step 3: Solve the linear inequality formed.

Original inequality $\mathbf{2}b + \mathbf{3}f < \mathbf{700}$

Example 1

Step 3: Solve the linear inequality formed.

Original inequality $\quad 2b + 3f < 700$

Substitute $b = 250$

Example 1

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{2b + 3f < 700}$
Substitute $b = 250$	$2(250) + 3f < 700$

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Simplify	

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Simplify	$500 + 3f < 700$

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Original inequality	$\mathbf{2b + 3f < 700}$
Substitute $b = 250$	$2(250) + 3f < 700$
Simplify	$500 + 3f < 700$
Use Subtraction Prop.	

Example 1

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{2b + 3f < 700}$
Substitute $b = 250$	$2(250) + 3f < 700$
Simplify	$500 + 3f < 700$
Use Subtraction Prop.	$500 - 500 + 3f < 700 - 500$

Example 1

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{2b + 3f < 700}$
Substitute $b = 250$	$2(250) + 3f < 700$
Simplify	$500 + 3f < 700$
Use Subtraction Prop.	$500 - 500 + 3f < 700 - 500$
Simplify	

Example 1

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{2b + 3f < 700}$
Substitute $b = 250$	$2(250) + 3f < 700$
Simplify	$500 + 3f < 700$
Use Subtraction Prop.	$500 - 500 + 3f < 700 - 500$
Simplify	$3f < 200$

Example 1

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{2b + 3f < 700}$
Substitute $b = 250$	$2(250) + 3f < 700$
Simplify	$500 + 3f < 700$
Use Subtraction Prop.	$500 - 500 + 3f < 700 - 500$
Simplify	$3f < 200$
Use Division Prop.	

Example 1

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{2b + 3f < 700}$
Substitute $b = 250$	$2(250) + 3f < 700$
Simplify	$500 + 3f < 700$
Use Subtraction Prop.	$500 - 500 + 3f < 700 - 500$
Simplify	$3f < 200$
Use Division Prop.	$\frac{3f}{3} < \frac{200}{3}$

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Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{2b + 3f < 700}$
Substitute $b = 250$	$2(250) + 3f < 700$
Simplify	$500 + 3f < 700$
Use Subtraction Prop.	$500 - 500 + 3f < 700 - 500$
Simplify	$3f < 200$
Use Division Prop.	$\frac{3f}{3} < \frac{200}{3}$
Simplify	

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Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{2b + 3f < 700}$
Substitute $b = 250$	$2(250) + 3f < 700$
Simplify	$500 + 3f < 700$
Use Subtraction Prop.	$500 - 500 + 3f < 700 - 500$
Simplify	$3f < 200$
Use Division Prop.	$\frac{3f}{3} < \frac{200}{3}$
Simplify	$f < 66.67$

Therefore, the maximum cost of a kilo of fish to the nearest pesos is Php 66.

Example 2

The difference between the scores of Connie and Minnie in the test is not more than 6 points. Suppose Connie's score is 32 points, what could possibly be the score of Minnie?

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

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Given: $32 = \text{Connie's score}$

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The difference between the scores of Connie and Minnie in the test is not more than 6 points. Suppose Connie's score is 32 points, what could possibly be the score of Minnie?

Given:	32	$=$	Connie's score
Let:	c	$=$	Connie's score

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The difference between the scores of Connie and Minnie in the test is not more than 6 points. Suppose Connie's score is 32 points, what could possibly be the score of Minnie?

Given:	32	$=$	Connie's score
Let:	c	$=$	Connie's score
	m	$=$	Minnie's score

Example 2

Step 2: Write the inequality that represents the relationship stated in the problem.

The difference between the scores of Connie and Minnie in the test is not more than 6 points. Suppose Connie's score is 32 points, what could possibly be the score of Minnie?

Given:	32	$=$	Connie's score
Let:	c	$=$	Connie's score
	m	$=$	Minnie's score
Find:			possible score of Minnie

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Step 2: Write the inequality that represents the relationship stated in the problem.

The difference between the scores of Connie and Minnie in the test is not more than 6 points. Suppose Connie's score is 32 points, what could possibly be the score of Minnie?

Given:	32	$=$	Connie's score
Let:	c	$=$	Connie's score
	m	$=$	Minnie's score
Find:			possible score of Minnie
Inequality:	$c - m$	$\leq$	6

Example 2

Step 3: Solve the linear inequality formed.

Original inequality $c - m \leq 6$

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Step 3: Solve the linear inequality formed.

Original inequality $\boldsymbol{c - m \leq 6}$

Substitute $c = 32$

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Original inequality	$\boldsymbol{c - m \leq 6}$
Substitute $c = 32$	$32 - m \leq 6$

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Substitute $c = 32$	$32 - m \leq 6$
Use Subtraction Prop.	

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Step 3: Solve the linear inequality formed.

Original inequality	$\boldsymbol{c - m \leq 6}$
Substitute $c = 32$	$32 - m \leq 6$
Use Subtraction Prop.	$32 - 32 - m \leq 6 - 32$

Example 2

Step 3: Solve the linear inequality formed.

Original inequality	$\boldsymbol{c - m \leq 6}$
Substitute $c = 32$	$32 - m \leq 6$
Use Subtraction Prop.	$32 - 32 - m \leq 6 - 32$
Simplify	

Example 2

Step 3: Solve the linear inequality formed.

Original inequality	$\boldsymbol{c - m \leq 6}$
Substitute $c = 32$	$32 - m \leq 6$
Use Subtraction Prop.	$32 - 32 - m \leq 6 - 32$
Simplify	$-m \leq -26$

Example 2

Step 3: Solve the linear inequality formed.

Original inequality	$\boldsymbol{c - m \leq 6}$
Substitute $c = 32$	$32 - m \leq 6$
Use Subtraction Prop.	$32 - 32 - m \leq 6 - 32$
Simplify	$-m \leq -26$
Use Multiplication Prop.	

Example 2

Step 3: Solve the linear inequality formed.

Original inequality	$\boldsymbol{c - m \leq 6}$
Substitute $c = 32$	$32 - m \leq 6$
Use Subtraction Prop.	$32 - 32 - m \leq 6 - 32$
Simplify	$-m \leq -26$
Use Multiplication Prop.	$-1(-m) \leq -1(-26)$

Example 2

Step 3: Solve the linear inequality formed.

Original inequality	$\boldsymbol{c - m \leq 6}$
Substitute $c = 32$	$32 - m \leq 6$
Use Subtraction Prop.	$32 - 32 - m \leq 6 - 32$
Simplify	$-m \leq -26$
Use Multiplication Prop.	$-1(-m) \leq -1(-26)$
Simplify	

Example 2

Step 3: Solve the linear inequality formed.

Original inequality	$\boldsymbol{c - m \leq 6}$
Substitute $c = 32$	$32 - m \leq 6$
Use Subtraction Prop.	$32 - 32 - m \leq 6 - 32$
Simplify	$-m \leq -26$
Use Multiplication Prop.	$-1(-m) \leq -1(-26)$
Simplify	$m \geq 26$

Therefore, the possible score of Minnie is greater than or equal to 26.

Example 3

Adeth has some Php 10 and Php 5 coins. The total amount of these coins is at most Php 750. Suppose there are 50 Php 5-coins. What is the possible number of Php 10-coins that Adeth has?

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

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Adeth has some Php 10 and Php 5 coins. The total amount of these coins is at most Php 750. Suppose there are 50 Php 5-coins. What is the possible number of Php 10-coins that Adeth has?

Given: $50 = \text{number of Php 5-coins}$

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Adeth has some Php 10 and Php 5 coins. The total amount of these coins is at most Php 750. Suppose there are 50 Php 5-coins. What is the possible number of Php 10-coins that Adeth has?

Given:	50	$=$	number of Php 5-coins
Let:	f	$=$	number of Php 5-coins

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

Adeth has some Php 10 and Php 5 coins. The total amount of these coins is at most Php 750. Suppose there are 50 Php 5-coins. What is the possible number of Php 10-coins that Adeth has?

Given:	50	$=$	number of Php 5-coins
Let:	f	$=$	number of Php 5-coins
	t	$=$	number of Php 10-coins

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

Adeth has some Php 10 and Php 5 coins. The total amount of these coins is at most Php 750. Suppose there are 50 Php 5-coins. What is the possible number of Php 10-coins that Adeth has?

Given:	50	$=$	number of Php 5-coins
Let:	f	$=$	number of Php 5-coins
	t	$=$	number of Php 10-coins
Find:			possible number of Php 10-coins

Example 3

Step 2: Write the inequality that represents the relationship stated in the problem.

Adeth has some Php 10 and Php 5 coins. The total amount of these coins is at most Php 750. Suppose there are 50 Php 5-coins. What is the possible number of Php 10-coins that Adeth has?

Given:	50	$=$	number of Php 5-coins
Let:	f	$=$	number of Php 5-coins
	t	$=$	number of Php 10-coins
Find:			possible number of Php 10-coins
Ineq.:	$5f + 10t$	$\leq$	750

Example 3

Step 3: Solve the linear inequality formed.

Original inequality $\quad 5f + 10t \leq 750$

Example 3

Step 3: Solve the linear inequality formed.

Original inequality $\quad 5f + 10t \leq 750$

Substitute $f = 50$

Example 3

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{5f + 10t \leq 750}$
Substitute $f = 50$	$5(50) + 10t \leq 750$

Example 3

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{5f + 10t \leq 750}$
Substitute $f = 50$	$5(50) + 10t \leq 750$
Simplify	

Example 3

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{5f + 10t \leq 750}$
Substitute $f = 50$	$5(50) + 10t \leq 750$
Simplify	$250 + 10t \leq 750$

Example 3

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{5f + 10t \leq 750}$
Substitute $f = 50$	$5(50) + 10t \leq 750$
Simplify	$250 + 10t \leq 750$
Use Subtraction Prop.	

Example 3

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{5f + 10t \leq 750}$
Substitute $f = 50$	$5(50) + 10t \leq 750$
Simplify	$250 + 10t \leq 750$
Use Subtraction Prop.	$250 - 250 + 10t \leq 750 - 250$

Example 3

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{5f + 10t \leq 750}$
Substitute $f = 50$	$5(50) + 10t \leq 750$
Simplify	$250 + 10t \leq 750$
Use Subtraction Prop.	$250 - 250 + 10t \leq 750 - 250$
Simplify	

Example 3

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{5f + 10t \leq 750}$
Substitute $f = 50$	$5(50) + 10t \leq 750$
Simplify	$250 + 10t \leq 750$
Use Subtraction Prop.	$250 - 250 + 10t \leq 750 - 250$
Simplify	$10t \leq 500$

Example 3

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{5f + 10t \leq 750}$
Substitute $f = 50$	$5(50) + 10t \leq 750$
Simplify	$250 + 10t \leq 750$
Use Subtraction Prop.	$250 - 250 + 10t \leq 750 - 250$
Simplify	$10t \leq 500$
Use Division Prop.	

Example 3

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{5f + 10t \leq 750}$
Substitute $f = 50$	$5(50) + 10t \leq 750$
Simplify	$250 + 10t \leq 750$
Use Subtraction Prop.	$250 - 250 + 10t \leq 750 - 250$
Simplify	$10t \leq 500$
Use Division Prop.	$\frac{10t}{10} \leq \frac{500}{10}$

Example 3

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{5f + 10t \leq 750}$
Substitute $f = 50$	$5(50) + 10t \leq 750$
Simplify	$250 + 10t \leq 750$
Use Subtraction Prop.	$250 - 250 + 10t \leq 750 - 250$
Simplify	$10t \leq 500$
Use Division Prop.	$\frac{10t}{10} \leq \frac{500}{10}$
Simplify	

Example 3

Step 3: Solve the linear inequality formed.

Original inequality	$\mathbf{5f + 10t \leq 750}$
Substitute $f = 50$	$5(50) + 10t \leq 750$
Simplify	$250 + 10t \leq 750$
Use Subtraction Prop.	$250 - 250 + 10t \leq 750 - 250$
Simplify	$10t \leq 500$
Use Division Prop.	$\frac{10t}{10} \leq \frac{500}{10}$
Simplify	$t \leq 50$

Therefore, the possible number of Php 10-coins that Adeth has is less than or equal to 50.

Thank you for watching.