Solving Problems Involving Linear Functions

Jonathan R. Bacolod

Sauyo High School

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   1.3 Compute for the slope.
2. Use the facts of the problem to form a linear function.
3. Graph the linear function.

Example 1

It has been observed that a particular plant's growth is directly proportional to time. It measured 2 cm when it arrived at the nursery and 2.5 cm exactly one week later. If the plant continues to grow at this rate, determine the function that represents the plant's growth and graph it.

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Let: $f(x) =$ plant's height

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Given:	b	$=$	2 cm (initial height)
Find:	m	$=$	$2.5 - 2$

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Function:	$f(x)$	$=$	$mx + b$
	$f(x)$	$=$	$0.5x + 2$

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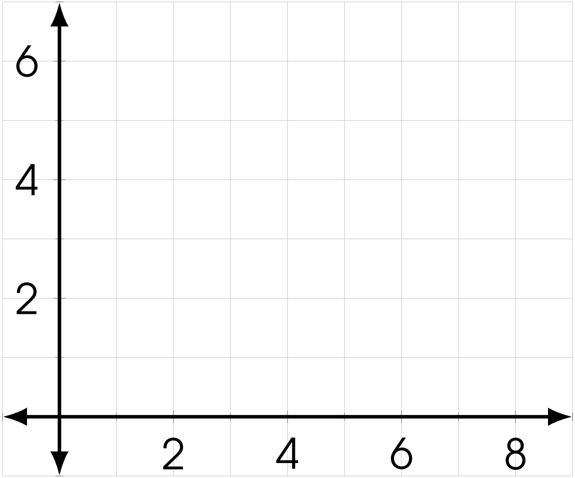

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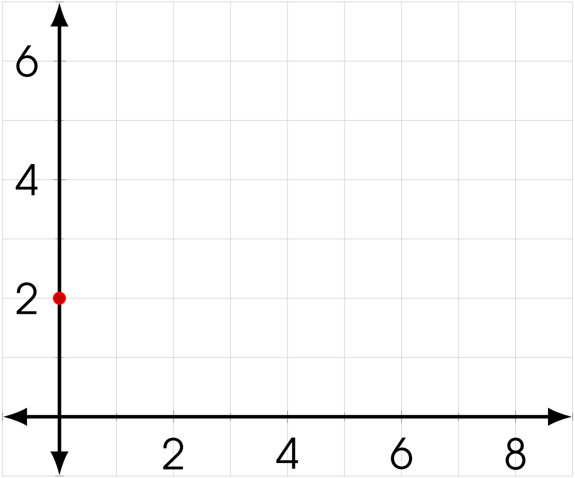

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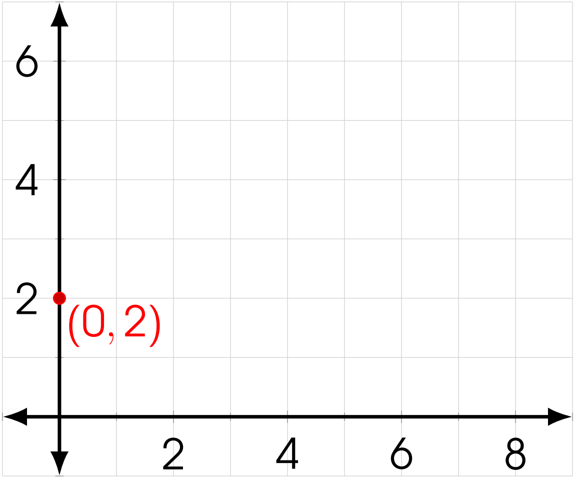

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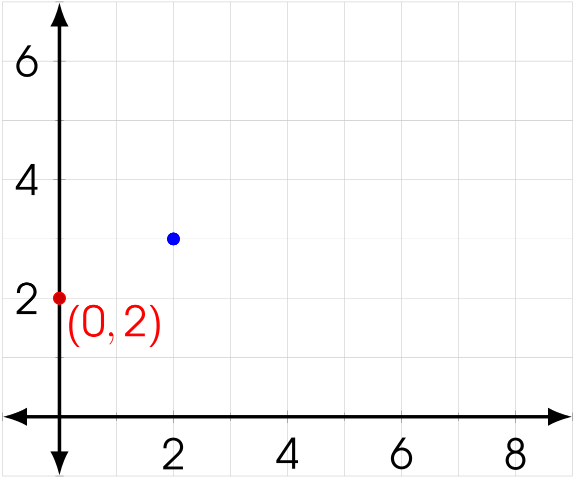

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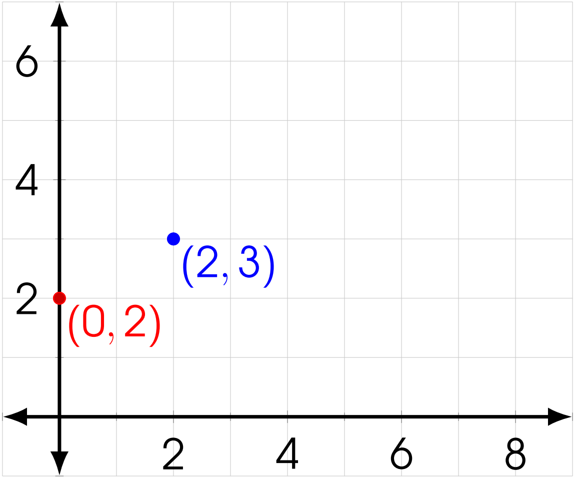

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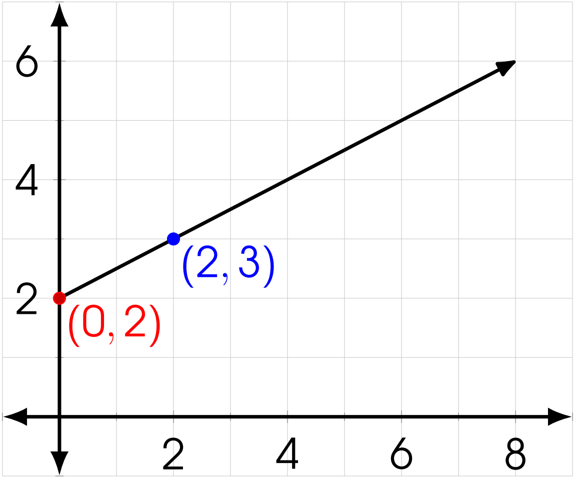

Example 2

Emman often rides a taxi from one place to another. The standard fare in riding a taxi is Php 40 as a flag-down rate plus Php 5 for every 200 meters or a fraction of it. Determine the function that represents the fare and graph it.

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Let:	$f(x)$	$=$	standard fare
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Given:	b	$=$	

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Given:	b	$=$	Php 40 (initial fare)

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Find:	m	$=$	

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Given:	b	$=$	Php 40 (initial fare)
Find:	m	$=$	Php 5 per 200 m.
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Find:	m	$=$	Php 5 per 200 m.
Function:	$f(x)$	$=$	$mx + b$
	$f(x)$	$=$	$5x + 40$

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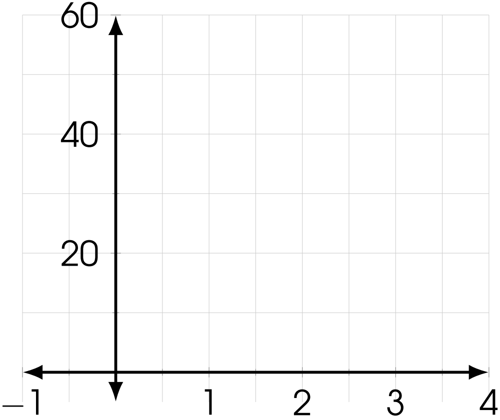

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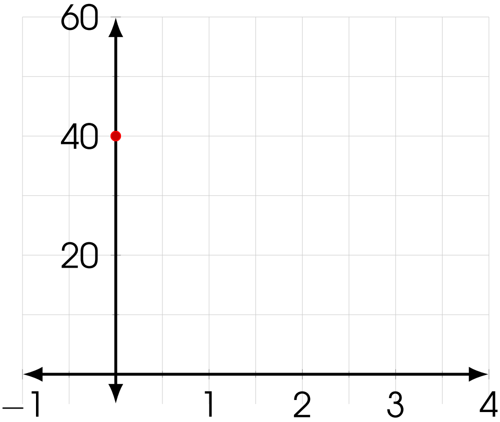

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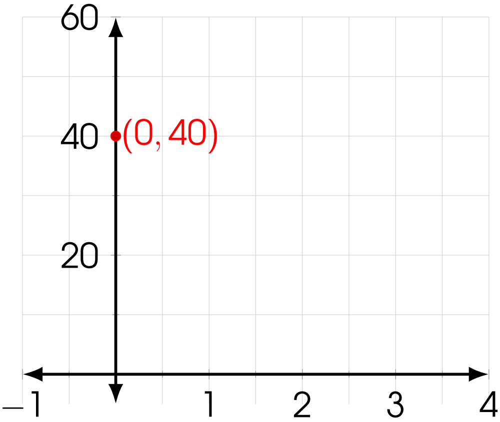

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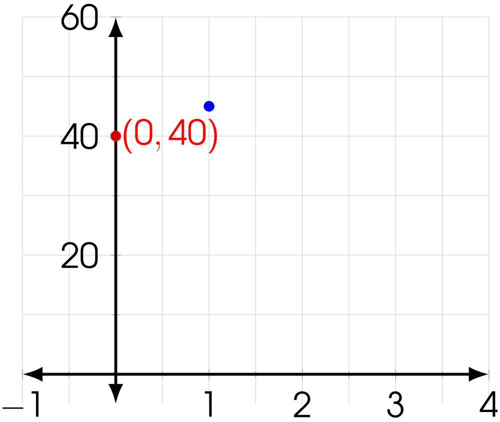

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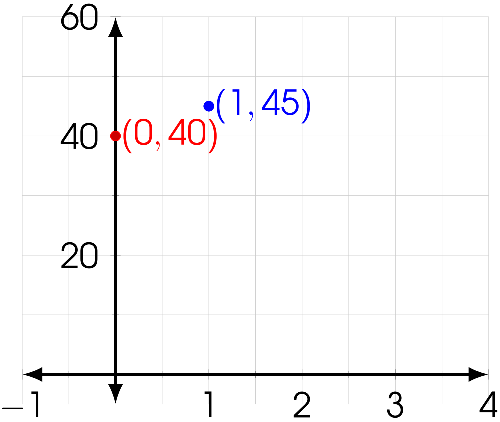

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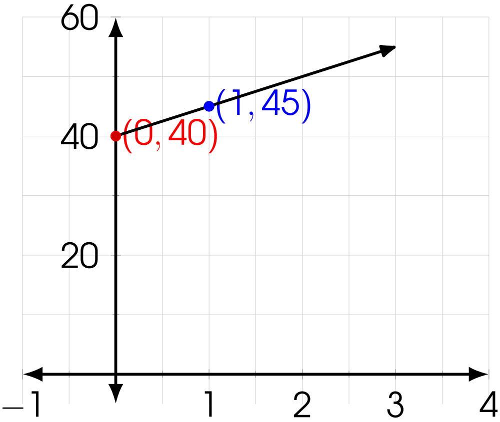

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A pay phone service charges Php 5 for the first three minutes and Php 1 for every minute additional or a fraction thereof. How much will a caller have to pay if his call lasts for 8 minutes? Write a rule that best describes the problem and draw its graph using any method.

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Given:	b	$=$	Php 5 (initial charge)

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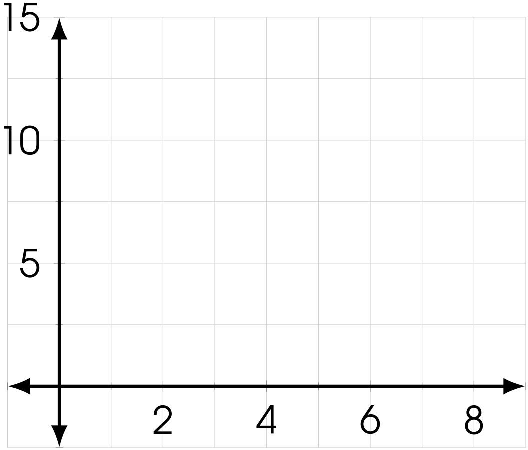

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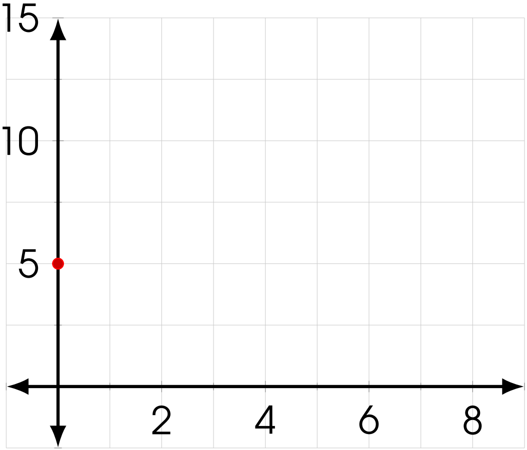

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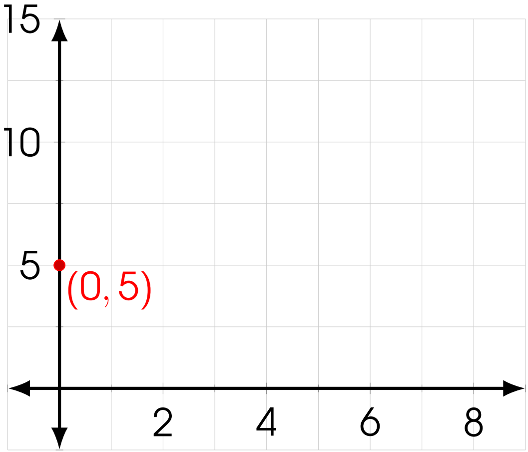

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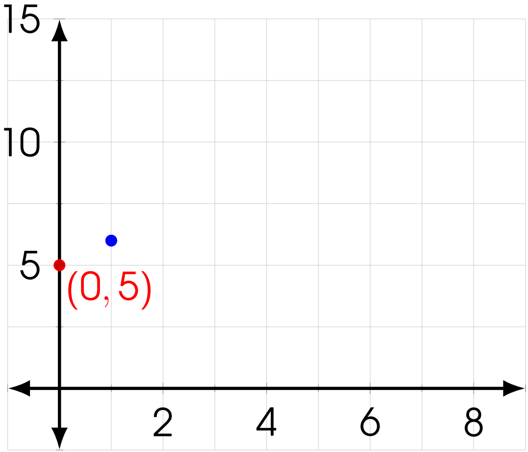

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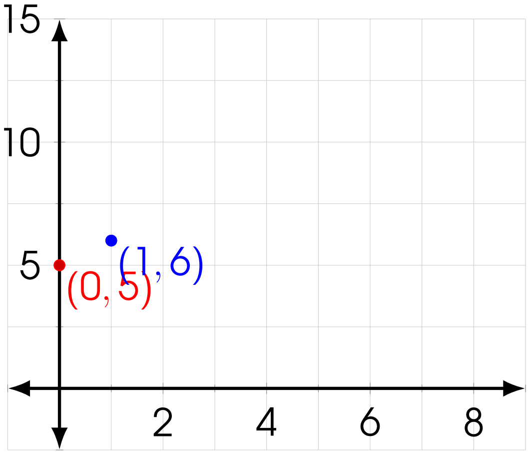
$$f(x) = x + 5$$

$$m = \frac{\text{rise}}{\text{run}} = 1 = \frac{1}{1}, b = 5$$



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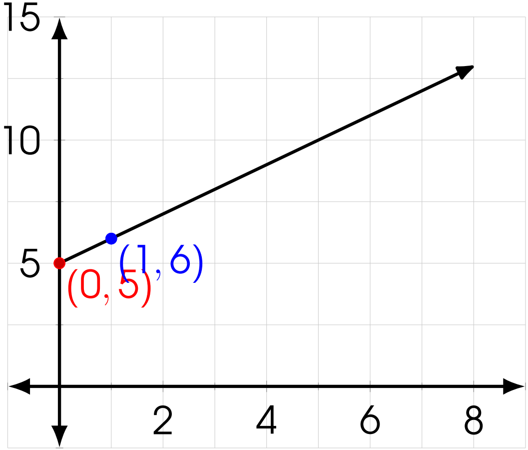

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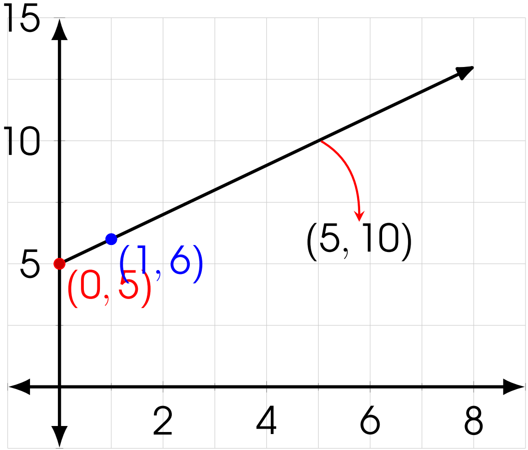

Example 3

The graph goes through the coordinates (5, 10), therefore a caller has to pay Php 10 if his call lasts for 8 minutes.

Example 4

A motorist drives at a constant rate of 60 kph. If his destination is 240 kilometers away from his starting point, how many hours will it take him to reach his destination? Write a rule that best describes the problem and draw its graph using any method.

Example 4

Step 1: Understand and analyze the problem.

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$$\begin{aligned} f(x) &= \text{distance travelled (in kilometers)} \\ x &= \text{time travelled (in hours)} \end{aligned}$$

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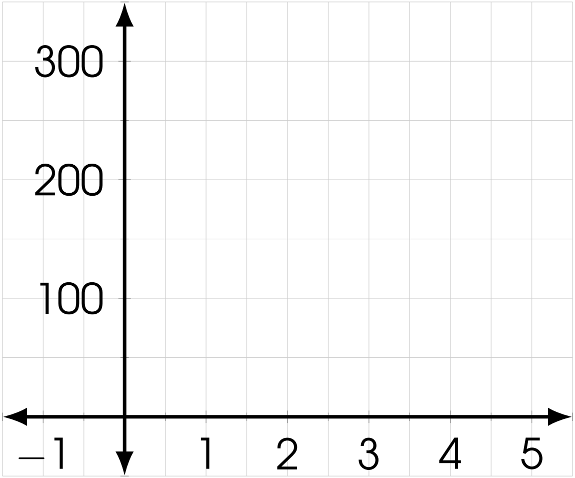

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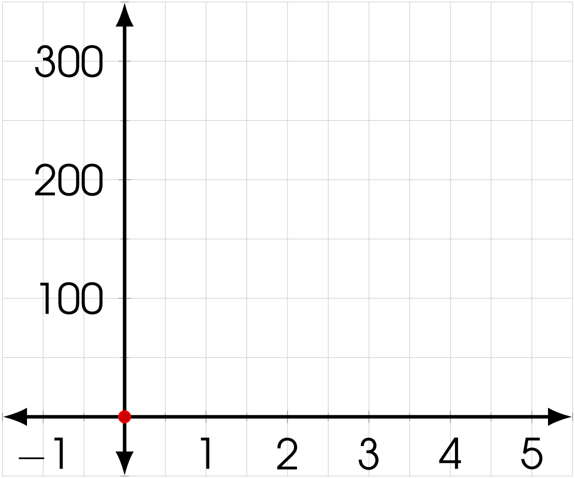

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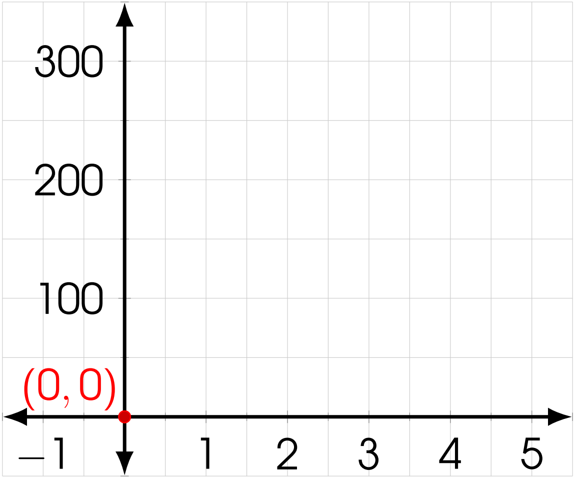

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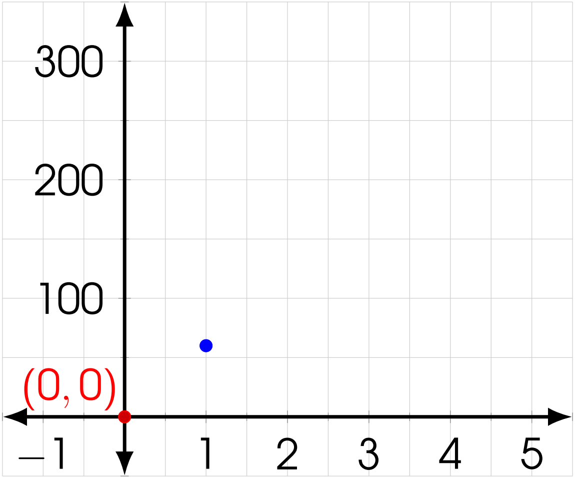

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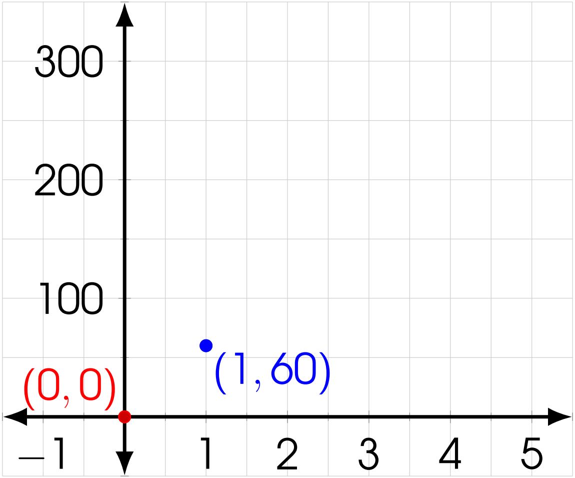

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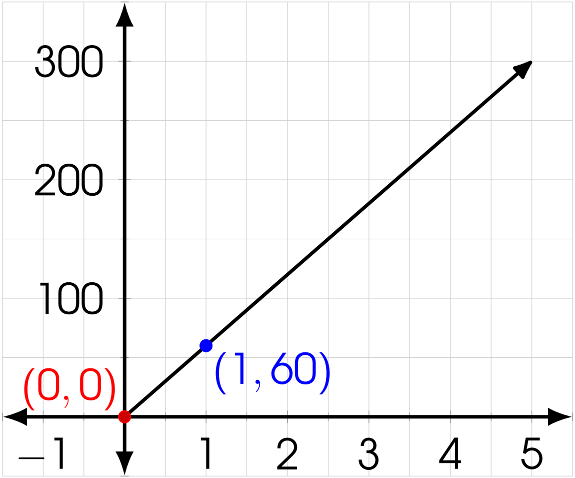

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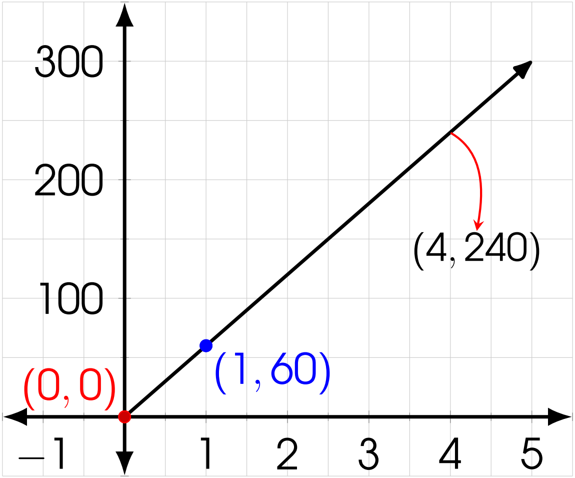

Example 4

The graph goes through the coordinates $(4, 240)$, therefore it will take the motorist 4 hours to reach his destination.

Thank you for watching.