

Two Linear Equations in Two Variables - Guided Lesson Explanation

Explanation#1

Step 1: Find the equation of each line.

Line A: is (7,9) and (-7,4)

Where m= slope Solving for m:

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(4-9)}{(-7-7)} = \frac{-5}{-14} = \frac{5}{14}$$

Solve for b (substituting (7, 9)):

$$y = \frac{5}{14}x + b = 9 = \frac{5}{14}(7) + b$$

$$b = 9 - \left(\frac{5}{14}\right)(7) = b = \frac{13}{2}$$

The equation for line A is: $y = \frac{5}{14}x + \frac{13}{2}$

Line B: (6,10) (-6,-10) $y = mx + b$

$$M = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(-10-10)}{(-6-6)} = \frac{-20}{12} = \frac{5}{3}$$

Solve for b:

$$y = \frac{5}{3}x + b = 10 = \frac{5}{3} \times 6 + b = 10 = \frac{30}{3} + b = b = 0$$

The equation for line b is : $y = \frac{5}{3}x + 0$

$$(A) : y = \frac{5}{14}x + \frac{13}{2}$$

$$(B) \quad y = \frac{5}{3}x + 0$$



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Step 2: When the lines intersect, it will be at the point where their equations are equal. Set each equation of the line equal to each other. This will allow to solve for the x value of that point.

$$\frac{5}{14}x + \frac{13}{2} = \frac{5}{3}x$$

$$= \frac{15x+273=70x}{42}$$

$$273 = 70x - 15x$$

$$x = \frac{273}{55}$$

$$x = 4.96$$

Step 3: Now that we have the x value, we can plug it into either equation of the line to determine the y value of the intersection point.

$$y = \frac{5}{14}(4.96) + \frac{13}{2} = 8.27$$

The point at which they intersect is : 4.96, 8.27

Explanation#2

Let's say the age of Sonya is S and the age of Alice is A. As we know, the age of Alice is half of Sonya's age.

So, Alice's age = $\frac{1}{2}S$

Given: sum of their age is 60.

$$S + \frac{1}{2}S = 60 = S = 40$$

$$A = \frac{1}{2}S = \frac{1}{2} \times 40 = 20$$

So, Alice's age is 20.



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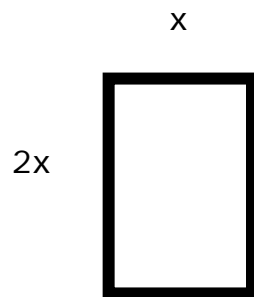
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Explanation#3

Let the width of the room = x

The length of the rectangle is $2x$.

Therefore, according to the question, the dimensions look like this:



Perimeter is the sum of all sides. So in this case the perimeter is equal to:

$$2x + 2x + x + x$$

We are told that the perimeter = 72.

$$72 = 2x + 2x + x + x \quad (\text{solve for } x; \text{ this will give us the width})$$

$$72 = 6x$$

$$12 = x$$

That means the width is 12 and the length is 24 ($2x$).

