Answer on Question #64738 – Math – Algebra

Question

Nick is given $50 to spend on a vacation. He decides to spend $5 a day. The amount Nick has left and the number of days are related Identify the variables in this situation:

x=_____ y=_____
y-intercept _____ slope _____

a) write an equation relating x and y;

b) use your equation to find out when Nick will have $15 left.

Solution

Let vs be the total amount of money for Nick's vacation. Nick has 50$.

So

$$vs=50.$$

Let ds be the daily amount of money Nick planning to spend. The question states it is equal to $5.

So

$$ds=5.$$

Denote the money which will be left by y.

Denote the number of days by x.

The amount of money will go down in case of Nick's decision to stay one, two, or more days.

a) The relation between y and x will be represented with help of the following equation:

$$y = vs - ds \cdot x,$$
$$y = 50 - 5x,$$

where x is the number of days, y is the amount Nick has left.

The y-intercept is

$$b = 50,$$

the slope is

$$m = -5.$$

The y-intercept shows that if Nick decides not to go to vacation, that is, $x = 0$ day, then Nick will still have $50 left and can easily use it for buying something else.

The slope shows if Nick decides to stay a day, then the left money will start to decrease and the cut will be equal to 5$. The spending for x days will be equal to $5x$ dollars.

According to the equation, if Nick decides to stay for 10 days, then he will not have any money left.

b) Using part a) the number x of days after which Nick will have 15$ left can be found from the following equation:

$$50 - 5x = 15,$$
$$5x = 50 - 15,$$
$$5x = 35,$$
$$x = 7.$$

The result tells that after 7 days Nick will have 15$ left.

Answer: a) $y = 50 - 5x$; **b)** after 7 days.