



Exercise 4.3

Q6. If the work done by a body on application of a constant force is directly proportional to the distance travelled by the body, express this in the form of an equation in two variables and draw the graph of the same by taking the constant force as 5 units. Also read from the graph the work done when the distance travelled by the body is:

(i) 2 units

(ii) 0 units

Ans: We are given that the work done by a body on application of a constant force is directly proportional to the distance travelled by the body.

Let the work done be W and let constant force be F .

Let distance travelled by the body be D .

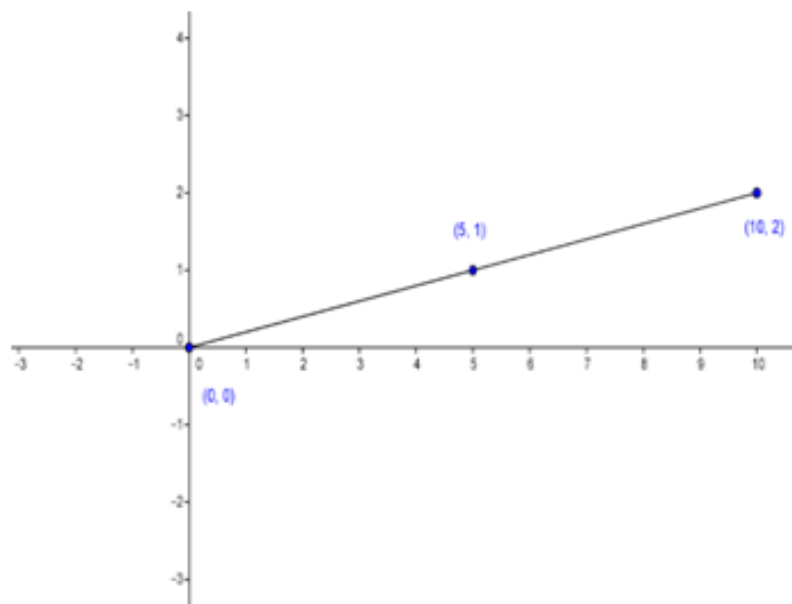
According to the question,

$$W \propto D \quad \Rightarrow W = F \cdot D.$$

We need to draw the graph of the linear equation $W = F \cdot D$, when the force is constant as 5 units, i.e., $W = 5D$.

We can conclude that $x = 0, y = 0$; $x = 5, y = 1$ and $x = 10, y = 2$ are the solutions of the linear equation $W = 5D$.

W	0	5	10
D	0	1	2



Therefore, we can conclude from the above mentioned graph, the work done by the body, when the distance is 2 units will be 10 units and when the distance is 0 units, the work done will be 0 unit.

Q7. Yamini and Fatima, two students of Class IX of a school, together contributed Rs 100 towards the Prime Minister's Relief Fund to help the earthquake victims. Write a linear equation which satisfies this data. (You may take their contributions as Rs x and Rs y .) Draw the graph of the same.

Ans: The contribution made by Yamini is Rs x and the contribution made by Fatima is Rs y .

We are given that together they both contributed Rs 100.

We get the given below linear equation from the given situation.

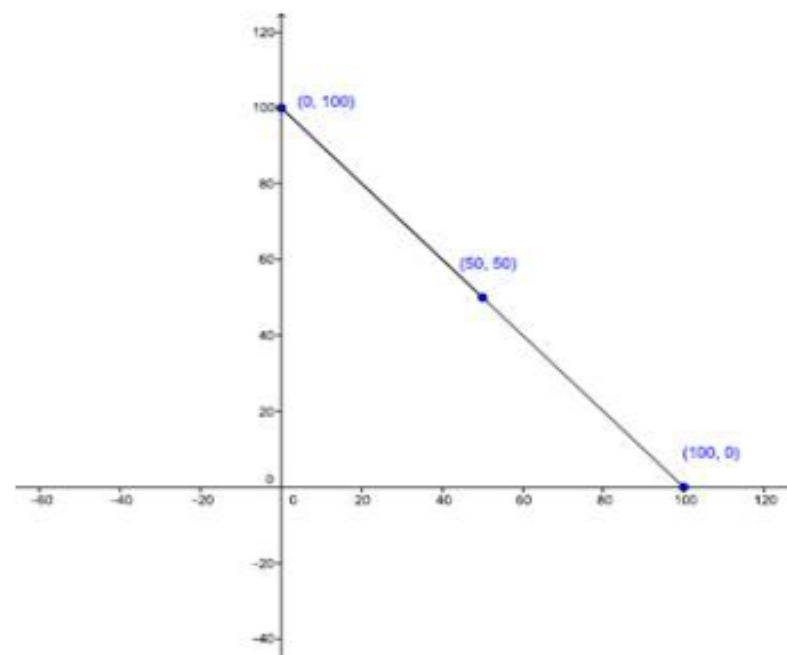
$$x + y = 100 .$$

We need to consider any 3 solutions of the linear equation $x + y = 100$, to plot the graph of the linear equation $x + y = 100$.

We can conclude that $x = 0, y = 100$; $x = 50, y = 50$ and $x = 100, y = 0$ are the solutions of the linear equation $x + y = 100$.

We can optionally consider the given below table for plotting the linear equation $x + y = 100$ on the graph.

x	0	50	100
y	100	50	0



Q8. In countries like USA and Canada, temperature is measured in Fahrenheit, whereas in countries like India, it is measured in Celsius. Here is a linear equation that converts Fahrenheit to Celsius:

$$F = \left(\frac{9}{5}\right)C + 32$$

(i) Draw the graph of the linear equation above using Celsius for x-axis and Fahrenheit for y-axis.

(ii) If the temperature is 30°C , what is the temperature in Fahrenheit?

(iii) If the temperature is 95°F , what is the temperature in Celsius?

(iv) If the temperature is 0°C , what is the temperature in Fahrenheit and if the temperature is 0°F , what is the temperature in Celsius?

(v) Is there a temperature which is numerically the same in both Fahrenheit and Celsius? If yes, find it.

Ans: We are given a linear equation that converts the temperature in Fahrenheit into degree Celsius.

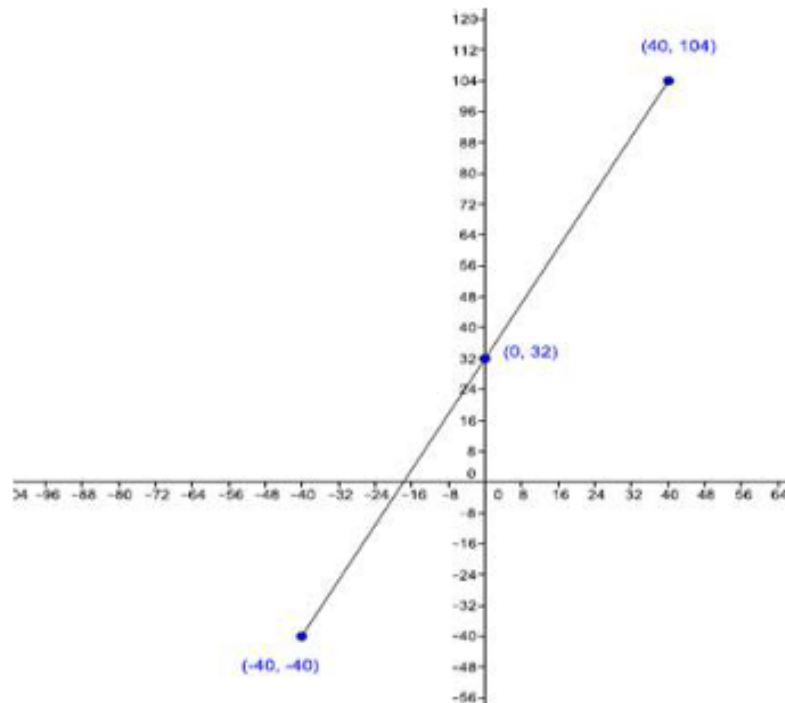
$$F = \left(\frac{9}{5}\right)C + 32$$

(i) We need to consider any 3 solutions of the linear equation $F = \left(\frac{9}{5}\right)C + 32$, to plot the graph of the linear equation $F = \left(\frac{9}{5}\right)C + 32$.

We can conclude that

$x = 0, y = 3; x = 1, y = 1$ and $x = 2, y = -1$ are the solutions of the linear equation $F = \left(\frac{9}{5}\right)C + 32$.

C	-40	0	40
F	-40	32	104



(ii) We need to find the temperature in Fahrenheit, when the temperature in degree Celsius is 30° .

$$F = \left(\frac{9}{5}\right)(30) + 32 = 9 \times 6 + 32 = 86^{\circ}$$

Therefore, we can conclude that the temperature in degree Celsius will be 35° .

(iv) We need to find the temperature in Fahrenheit, when the temperature in degree Celsius is 0° .

$$F = \left(\frac{9}{5}\right)(0) + 32 = 32^{\circ}$$

Therefore, we can conclude that the temperature in Fahrenheit will be 32° .

We need to find the temperature in degree Celsius, when the temperature in

Fahrenheit is 0° .

$$0 = \left(\frac{9}{5}\right)C + 32 \Rightarrow \frac{9}{5}C = 0 - 32$$

$$\Rightarrow C = -32 \times \frac{5}{9} = -17.77^{\circ}.$$

Therefore, we can conclude that the temperature in degree Celsius will be -17.77°

(v) We need to find a temperature that is numerically same in both Fahrenheit and degree Celsius.

$$F = \left(\frac{9}{5}\right)F + 32 \Rightarrow F - \frac{9F}{5} = 32 \Rightarrow -\frac{4F}{5} = 32$$

$$\Rightarrow F = -40^{\circ}.$$

Therefore, we can conclude that the temperature that is numerically same in Fahrenheit and degree Celsius will be -40° .

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