

Graphing Linear Relations

A table of values can be used to find the relation between x and y for a **linear relation**. The graph of a linear relation is always a straight line.

Ordered pairs always have brackets, a comma, and the coordinates in the order x then y .

If the x -coordinate is positive, go right from the origin, and if it is negative, go left from the origin.

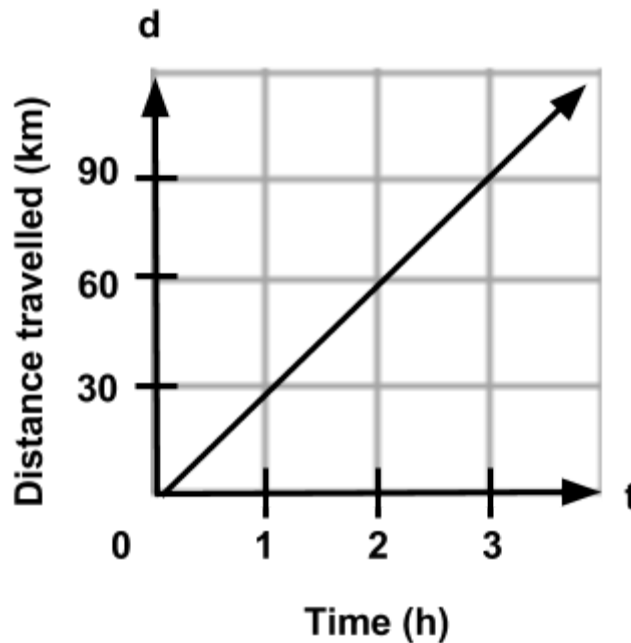
If the y -coordinate is positive, go up from the origin, and if it is negative, go down from the origin.

Example

$(3, -6)$ = 3 units to the left, 6 units down

Using a graph is a great way to interpolate information such as the approximate values of a particular variable when given the value of the other variable.

Example



The given graph shows the distance travelled by a car over a period of time.

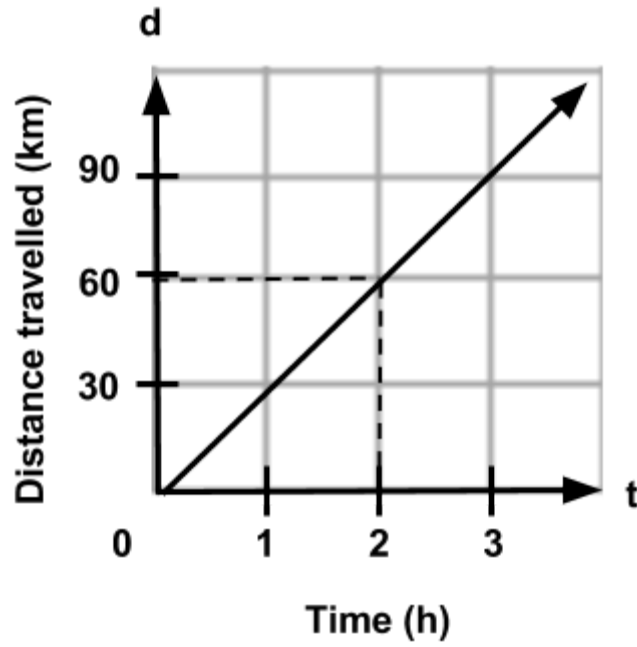
How far has the car travelled after 2h?

Solution

To determine how far the car has travelled after 2h, interpolate this information from the graph.

Location 2 along the t-axis, and go vertically upward until the line on the graph is reached.

At this point, move horizontally to the left until the d-axis is reached. The value located here represents how many kilometres the car travelled in 2h.

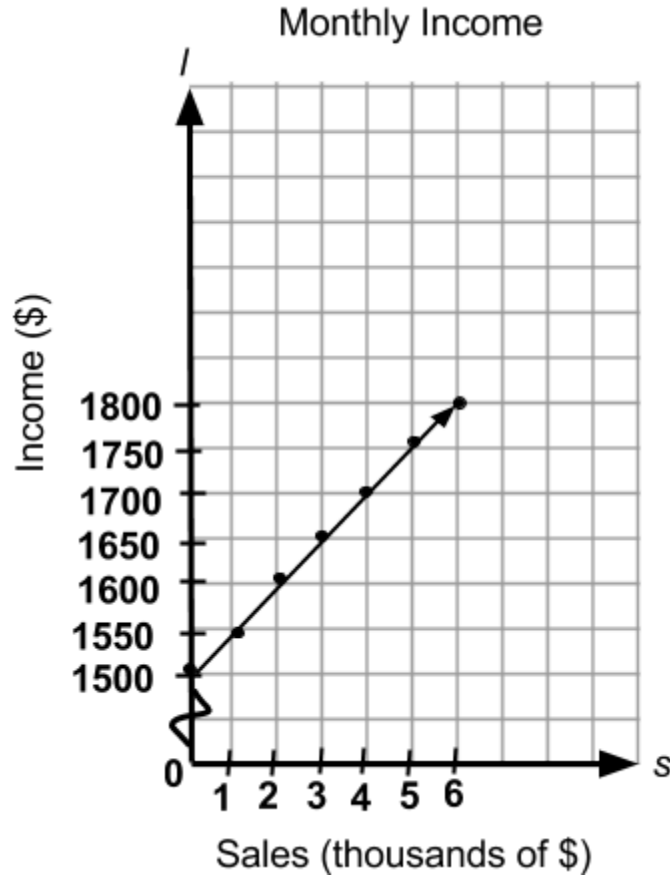


After 2h, the car has traveled 60km.

A graph can also be used to **extrapolate** information, meaning that by extending a given graph, you can determine particular values that may not be displayed on the graph.

Example

A furniture salesman receives 5% of his total sales plus a base monthly salary of \$1500. The graph representing his income with respect to sales is shown.

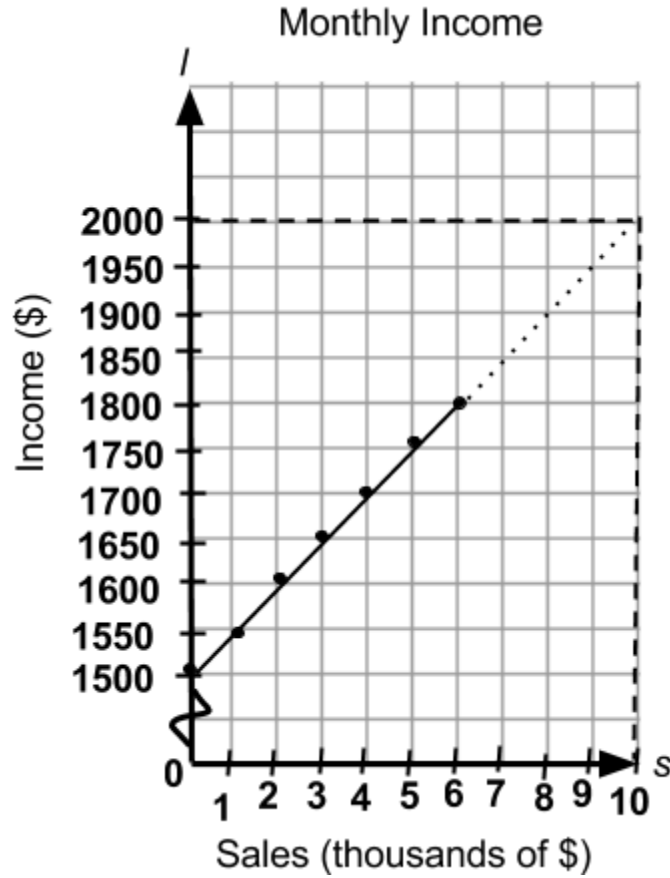


If the salesman wanted to earn \$2000/month in total income, what would the monthly sales need to be?

Solution

Extrapolate from the graph.

Using the graph, extend the line of relation. Start on the income axis and locate \$2000. Travel right until you reach the line of relation. Then, travel down to the sales axis to read the value for required monthly sales.



The salesman needs a monthly sales of \$10000 to earn a total salary of \$2000/month.