# Chapter 9 Linear Relations

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## Unit Test

Vocabulary

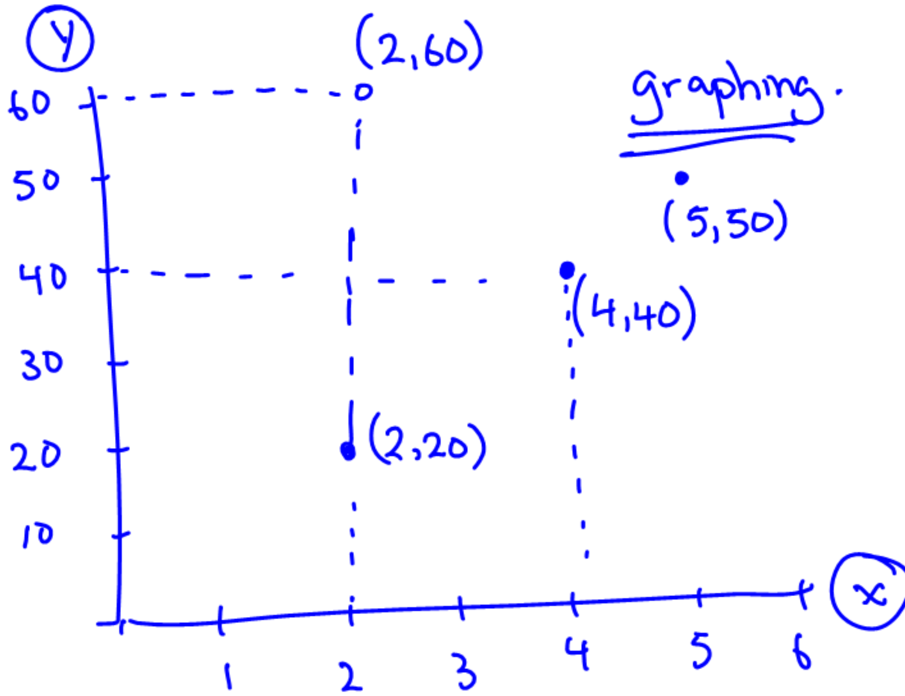
graphing.

(x , y)

(hours, $)

( 2 , 20)

( 5, 50)



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## 9.1 Notes: Analysing Graphs of Linear Relations

*Linear Relation follows 2 patterns (x and y), graph makes a line

Betty is babysitting for the Jones. They are going to pay her $5 per hour, plus a bonus of $8 because the Jones children are very young and need extra care. She decides to make a table to see how much she will earn.

| x<br>Hours worked | y<br>Money earned |
|---|---|
| 0 | 8 |
| 1 | 13 |
| 2 | 18 |
| 3 | 23 |
| 4 | 28 |
| 5 | 33 |

+1 +5

A table of values is: a way to organize pairs of numbers from a relationship.
It may not show all the data

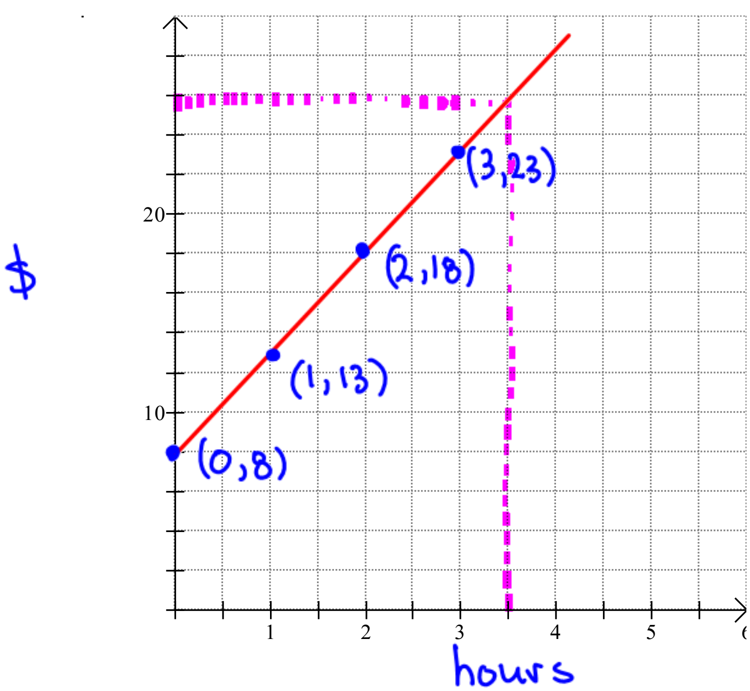
Note: This table could also be drawn as a horizontal table

Convert this to a horizontal table in the space below:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| x | hours | 0 | 1 | 2 | 3 | 4 | 5 |
| y | $ | 8 | 13 | 18 | 23 | 28 | 33 |

+1 +1

+5 +5




Another way to represent a table of values is to draw a graph.

Why is a line graph more appropriate than a bar graph or a pictograph?
we are comparing pairs of numbers, not amounts in categories.

What do you notice about the pattern made by the dots on the graph?
- they make a line.
- right 1 unit, up 5 units.

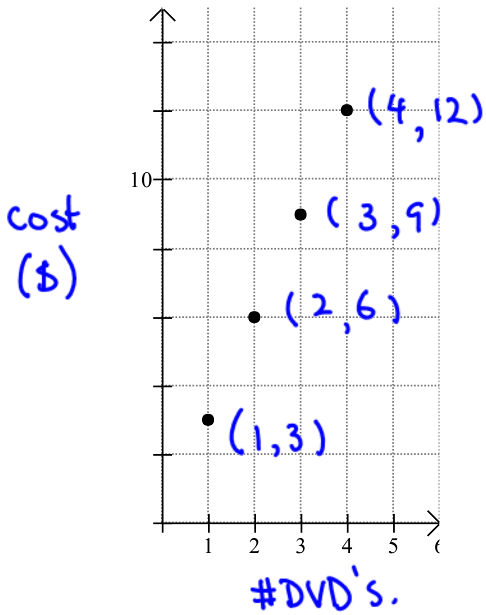
Often the pattern made by the dots on a graph can be used to make predictions.

how much for 3.5 hours? approx $25.50

when do you earn $10? approx 2.5 hours

The following graph shows how much it costs to buy blank DVD's.

*Cost vs # of DVD's*




What pattern do you notice?

DVD's : +1     Relationship makes a line,

cost : +3     $y = 3 \cdot x$

Make a table of values for this graph:

| x | #DVD's | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| y | cost | 3 | 6 | 9 | 12 | 15 |

If the relationship continues, what might be the cost for 12 DVD's?

$y = 3 \cdot x$

when $x = 12$

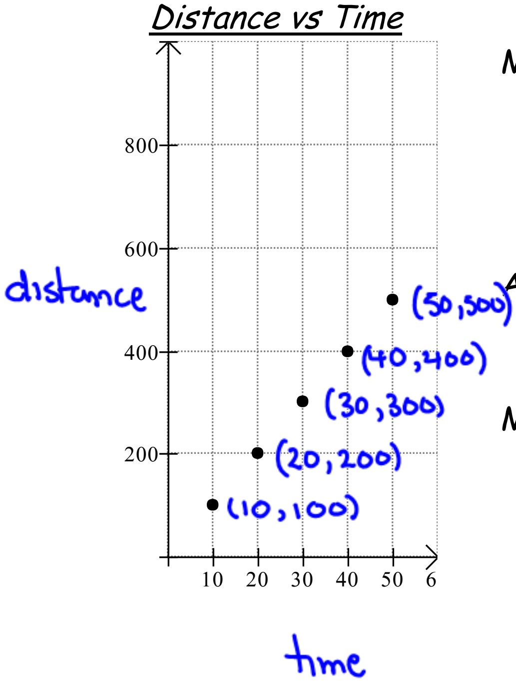
$y = 3 \cdot 12 = \underline{\underline{36}}$

Could you make a prediction for how much 20.5 DVD's might cost?

you could, but it makes no sense to because who wants $\frac{1}{2}$ of a DVD.

Fred is running a steady pace for an 800m sprint, and his friend Harry is charting his progress:

*Distance vs Time*




Make a table of values for this graph.

| x | time | 10 | 20 | 30 | 40 |
|---|---|---|---|---|---|
| y | distance | 100 | 200 | 300 | 400 |

AMake a prediction for when he will finish.

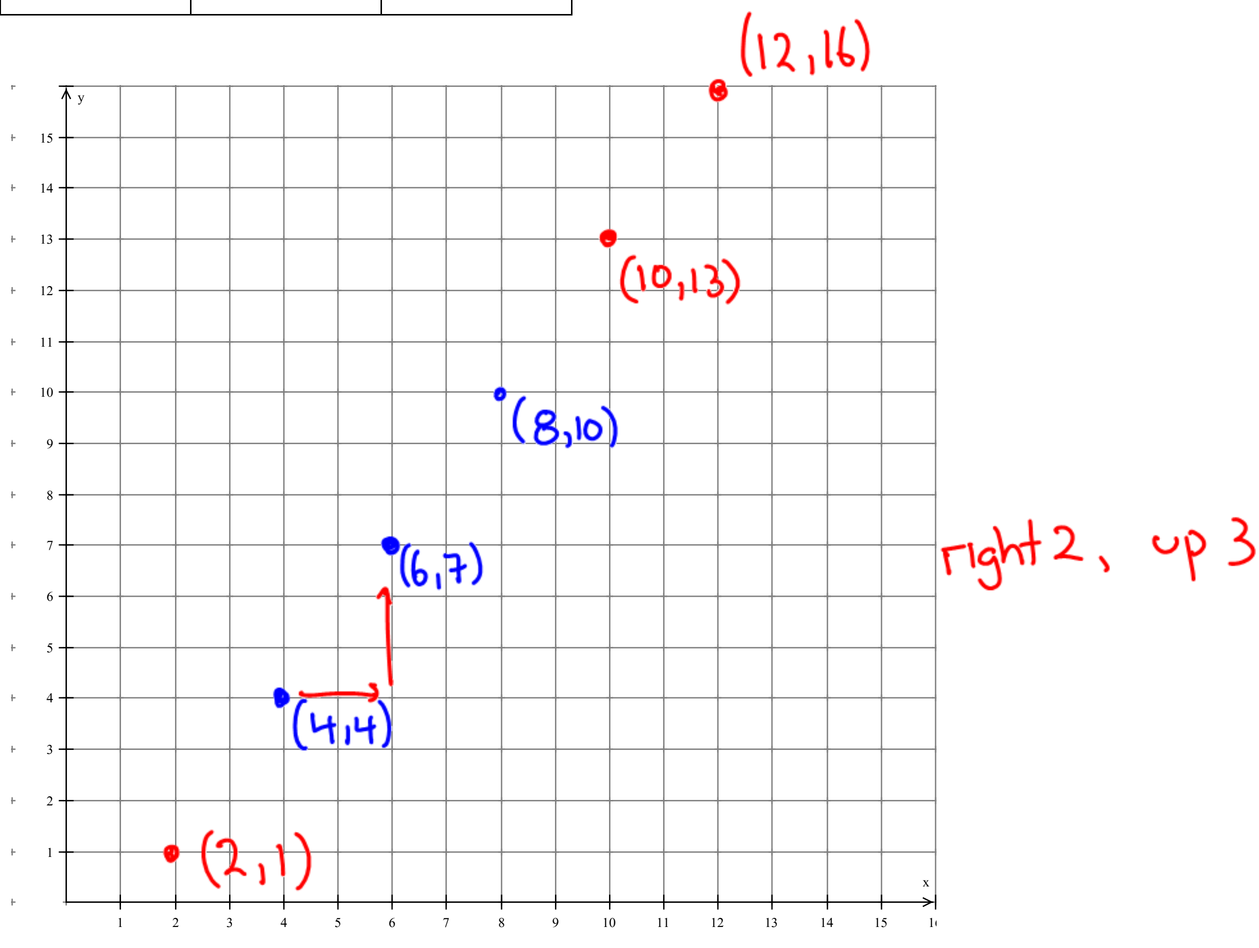
$y = 10 \cdot x$     he will run 800m in 80 seconds.

Make a prediction for where he will be at 35 seconds.

at 35 seconds, he will be at 350m. Unlike the DVD example, it makes sense to have some data between the coordinates.

Use the table to plot the graph and find 2 more numbers that might fit the table:

| | | | |
|---|---|---|---|
| x | 4 | 6 | 8 |
| y | 4 | 7 | 10 |




For what value of *a* would (14,a) be a coorindate on the graph?

" what would the y value be if x= 14? "

(14,19) is on the graph so

$\underline{\underline{a = 19}}$