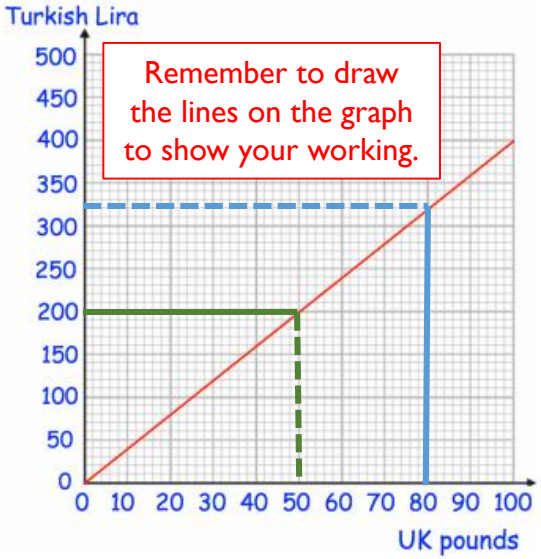
Knowledge Organiser: Graphs: The basics and real life graphs

What you need to know:

Conversion graphs



Change £80 into Turkish lira

1) Start at 80 on the horizontal axes as this for pounds and go up vertically until you reach the line
2) From the line, read horizontally until you get to the axis showing lira

Change 600 Turkish lira to pounds

As this value is not shown by the graph, we have to use a value that is to help.

1) Start at 200 on the vertical axes and go across horizontally until you reach the line. From the line, read vertically until you get to the axes.
2) 200 lira = £50
   600 lira = £150

Gradient

Gradient: This is the steepness of the line. The highest the number the steeper the line. We use the formula before to calculate it:

$$Gradient = \frac{difference\ in\ y}{difference\ in\ x}$$

(3, 4) and (5, 10)

Subtract the two y values.

$$\text{Gradient} = \frac{10-4}{5-3} = \frac{6}{2} = 3$$

Subtract the two x values.

Gradient = 3

Key Terms:

Axes: A fixed reference line on a grid to help show the position of coordinates.
Convert: Change a value or expression from one form to another.
Equation: A mathematical statement containing an equals sign.
Gradient: How steep a line is at any point.
Midpoint: The point halfway along a line or between two coordinates.
Conversion graph: A graph which converts between two variables.
Distance-time graph: A graph that shows a journey and the relationship between the distance reached in a given time.
Real - life graph: This is a graph that represents a situation that we would see in real life.
Intercept: Where two graphs cross.
y-intercept: Where a graph crosses the y-axis.
Gradient: The rate of change of one variable with respect to another. This can be seen by the steepness.
Stationary: A person/vehicle is not moving.

Hegarty maths clip numbers

Linear graphs: 206 - 212

Real life graphs: 712 – 715, 874 – 879, 894 - 895

Gradient: 200 - 204

hegartymaths

You need to be able to:

- Complete and read a distance-time graph.
- Calculate speed from a graph.
- Read information from a conversion graph and use this to solve problems.
- Interpret real life graphs, including distance-time and conversion graphs.
- Calculate the gradient of a line.
- Calculate the midpoint of coordinates.
- Complete a table of values for a linear graph and draw it.

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What you need to know:

Linear graphs

Linear graphs are straight line graphs. We substitute the x value into the equation to get the y value. Once we have both we can then plot the coordinates and draw the graph.

Draw the graph of y = 2x – 1.

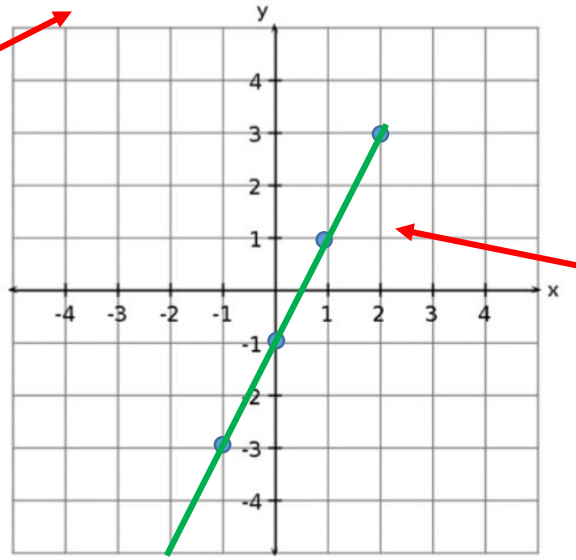
To do this we multiply the x value by 2 and then subtract 1 to get the y value.

y = 2x – 1

X	-2	-1	0	1	2
Y	-5	-3	-1	1	3

Multiply this value by 2 and then subtract 1 to get the y value.

This coordinate would be (-2,-5).



Don't forget to draw a straight line through all of the coordinates you have plotted.

Notice this graph has a gradient of 2 (the y values go up by 2 each time) and a y-intercept of -1 (the graph cuts through the y axis at -1).

Calculating the midpoint

Calculate the midpoint of: (3, 5) and (9, 11)

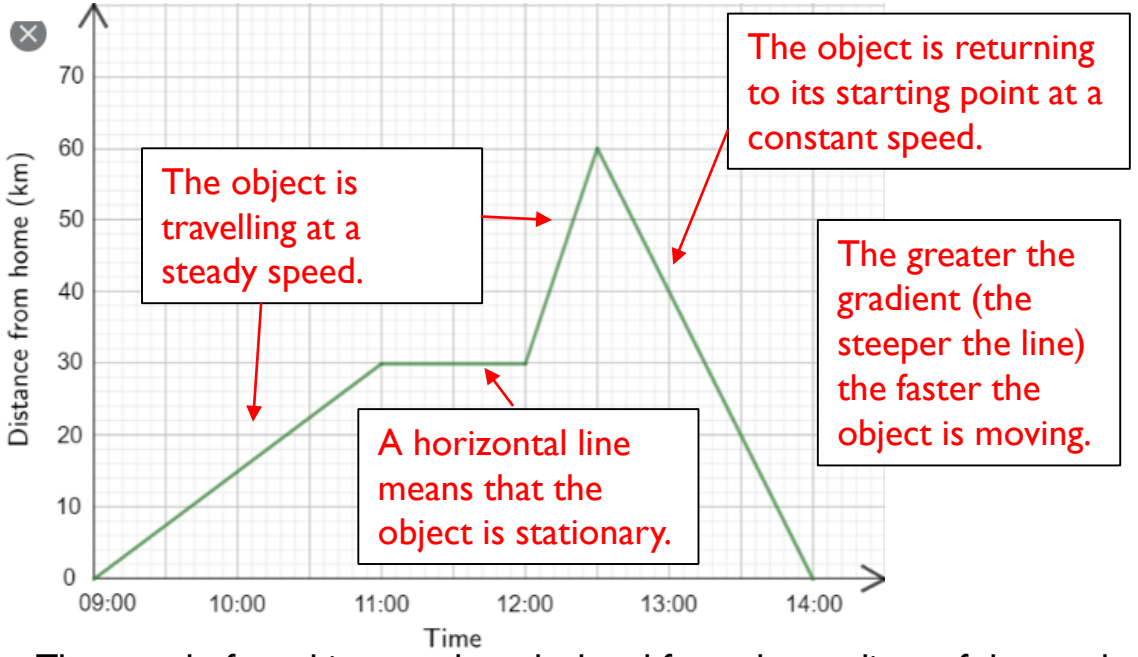
(3, 5)
+ (9, 11)
=(12,16)

Add the x values together then add the y values together.

(12,16) ÷ 2 = (6,8)

Divide both the x and y values by 2 to find the middle point.

Distance-time Graphs



The speed of an object can be calculated from the gradient of the graph.

E.g. calculate the speed at which the object travelled between 9am and 11am.

Speed = 30 ÷ 2
= 15 km/hr