

Fractions and pie charts 1

Discover



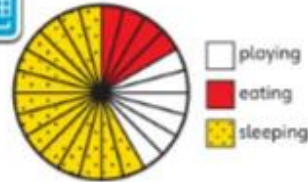
Emily is two months old now. She sleeps most of the day.

- playing
- eating
- sleeping

- 1 a) For what fraction of the day does Emily sleep?
- b) Max says: 'I think she spends $\frac{1}{3}$ of each day just eating!'
Is he correct?

Share

a) There are 24 segments in the pie chart. Each segment represents one hour out of 24.



- playing
- eating
- sleeping

Dotted segments represent the hours when Emily is sleeping. This is more than half the day!

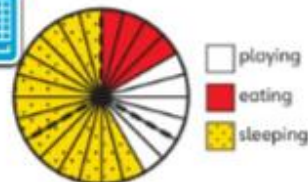


14 segments out of 24 are dotted.
 $\frac{14}{24} = \frac{7}{12}$
Emily sleeps for $\frac{7}{12}$ of each day.

Pie charts represent fractions very clearly. The whole and the parts are very clear to see.



b) 24 divided by 3 is 8.
So $\frac{1}{3}$ of the chart would be 8 segments out of 24.



- playing
- eating
- sleeping

I worked out $\frac{1}{3}$ of the whole chart. There are 24 segments.



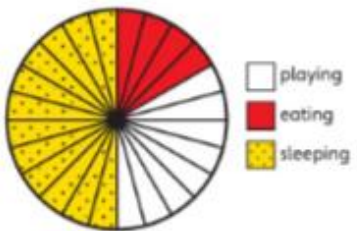
Max is not correct. Emily spends $\frac{4}{24}$ of the day eating.
 $\frac{4}{24} = \frac{1}{6}$

I worked out equivalent fractions. I know that $\frac{1}{6}$ is less than $\frac{1}{3}$.



Think together

1 Emily is now 2 years old. The pie chart shows how her day is divided. Complete the information.



$\frac{1}{2}$ of Emily's time is spent _____ .
 _____ of Emily's time is spent eating.
 _____ of Emily's time is spent playing.

2 Emily is now 6 years old. The table shows how she spends her time. Discuss how you would fill in the pie chart and fraction statements based on this information.

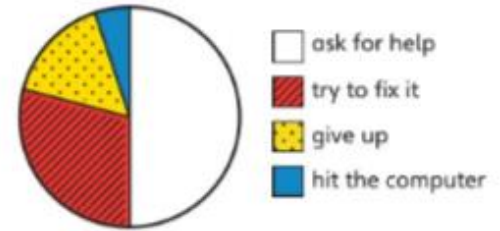


Sleeping	Eating	Playing	School
9 hours	3 hours	6 hours	6 hours

$\frac{9}{24}$ of Emily's time is spent _____ .
 $\frac{3}{24}$ of her time is spent _____ .
 $\frac{6}{24}$ of her time is spent _____ .



3 a) 80 adults were asked what they do when a computer stops working. Estimate the fractions for each action.



I will check that my fractions add up to 1.



What other information can you get from the pie chart?
 b) This pie chart shows how 30 children answered the question.



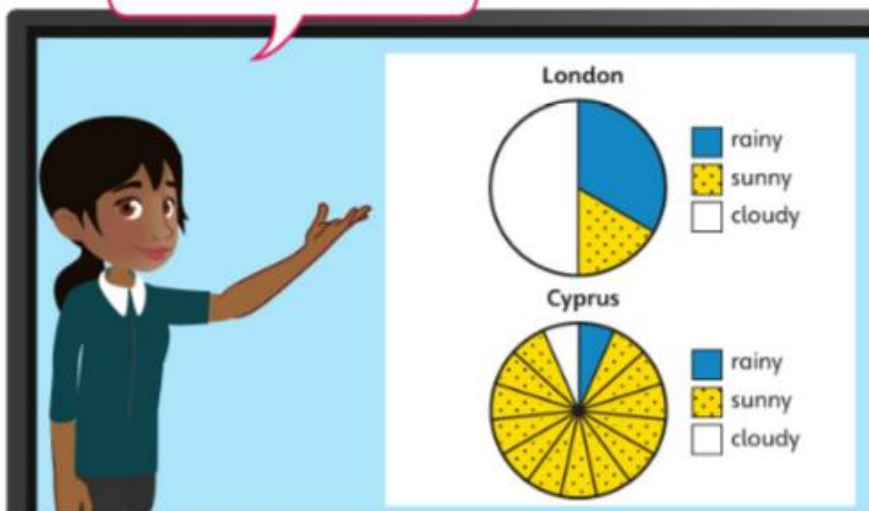
More children than adults said they would give up. Do you agree?

Fractions and pie charts 2

Discover



These charts show the weather in London and Cyprus in April.



- 1 a) In London $\frac{1}{3}$ of the month of April was rainy.
How many days were sunny?
- b) How many sunny days were there in Cyprus in April?

Share

a) There are 30 days in April.

Method 1

$\frac{1}{3}$ of the days are rainy.

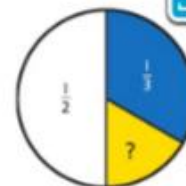
$\frac{1}{3}$ of 30 is 10.

$\frac{1}{2}$ of the days are cloudy.

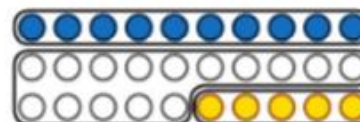
$\frac{1}{2}$ of 30 is 15.

$30 - 10 - 15 = 5$.

So there were 5 sunny days.



I found the remaining days.



Method 2

$$\frac{1}{2} + \frac{1}{3} + ? = 1$$

$$\frac{3}{6} + \frac{2}{6} + ? = 1$$

$\frac{1}{6}$ of the days are sunny.

$\frac{1}{6}$ of 30 is 5.

I found the remaining fraction.



b) There are 15 segments in the pie chart.

$\frac{2}{5}$ of the days were not sunny.

$$\frac{1}{5} \text{ of } 30 = 30 \div 5 = 6$$

$$\frac{2}{5} \text{ of } 30 = 2 \times 6 = 12$$

4 out of 30 days were not sunny.

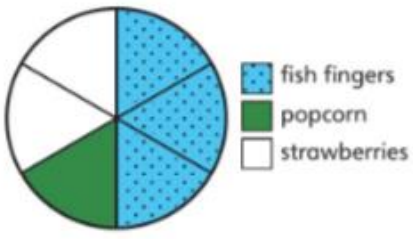
So 26 days were sunny.



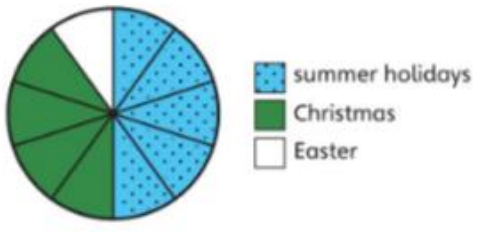
Think together

1 Max has been finding out the favourite food of the class. 4 more children like strawberries than like popcorn. Complete the statements.

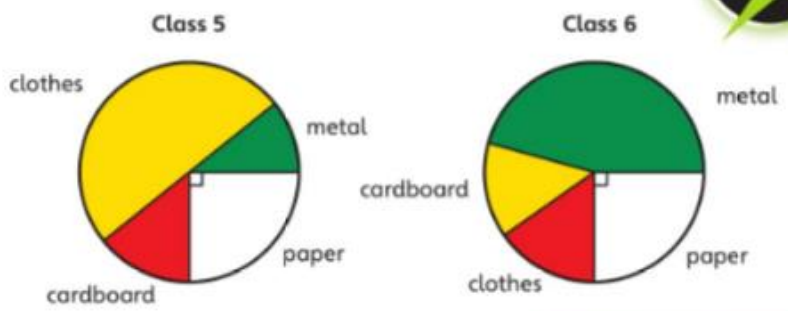
- of the class like fish fingers.
- of the class like popcorn.
- children like strawberries.



2 Isla investigated which school holiday was the favourite in the school. 45 children said the summer holidays. How many children said Christmas?



3 a) Classes 5 and 6 collected waste to recycle.

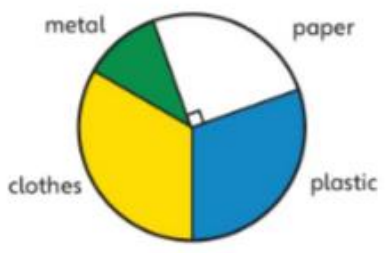


Class 5 collected 20 kg of waste in total.
Class 6 collected 10 kg of metal.
Which class collected more paper?

One section has a right angle sign. I can use this to work out the exact fraction of that part.



b) Class 4 also collected waste.



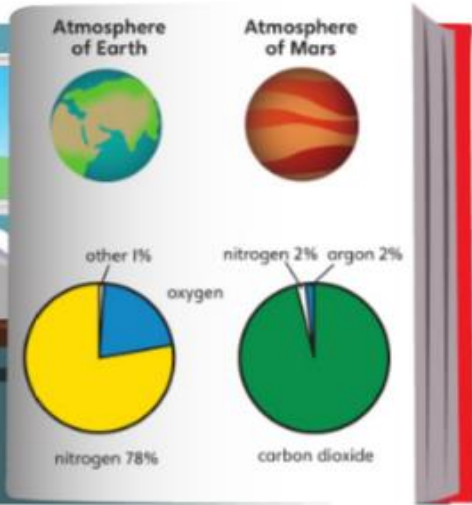
They collected 3.5 kg of metal. Estimate the weight of clothes.

Percentages and pie charts

Discover



I estimate one fifth of Earth's atmosphere is oxygen. I thought it would be more than that.



- 1 a) What fraction of the atmosphere of Mars is nitrogen, argon and carbon dioxide?
- b) How accurate is Aki's estimate for Earth's atmosphere?

Share

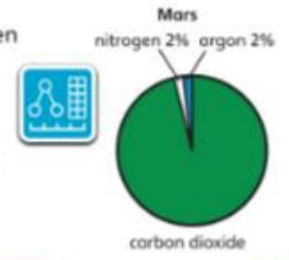
a) 2% of the atmosphere of Mars is nitrogen and 2% is argon.

$$2\% = \frac{2}{100} = \frac{1}{50}$$

So $\frac{1}{50}$ of the atmosphere is argon and $\frac{1}{50}$ is nitrogen.

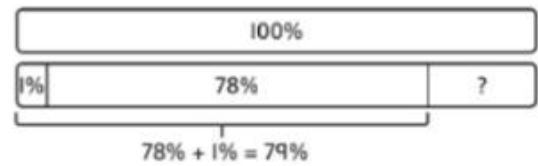
That means $\frac{48}{50}$ must be carbon dioxide.

$$100\% - 2\% - 2\% = 96\%$$

$$96\% = \frac{96}{100} = \frac{48}{50} = \frac{24}{25}$$


I checked using the percentages.

b) The whole pie chart represents 100%.



$$100 - 79 = 21$$

The section for oxygen must represent 21%.

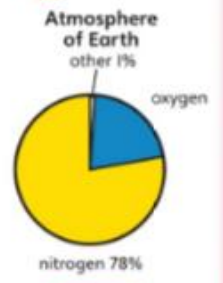
Aki estimates $\frac{1}{5}$.

$$\frac{1}{5} = \frac{20}{100} = 20\%$$



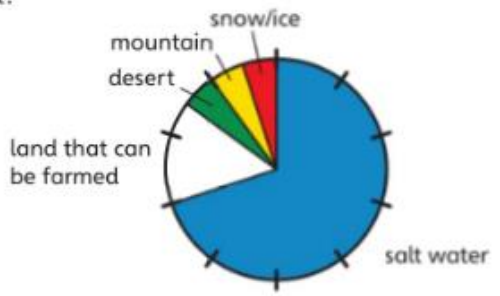
Aki's estimate is just 1% too small.

An estimate within 1% of the real value is very accurate.

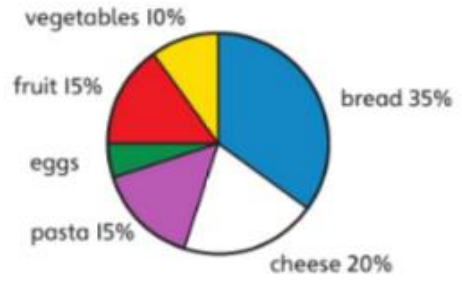


Think together

1 This pie chart shows what percentage of Earth's surface is covered by the different features. What are the percentages shown for each section of the pie chart?



2 Andy produced this pie chart to show what he ate during the week.

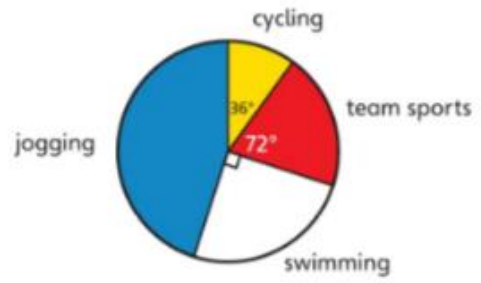


Which statements match the pie chart?

- More than one third of his food was bread.
- Out of every 250 g, 50 g was cheese.
- $\frac{1}{3}$ of of his food was fruit and vegetables.
- He ate three times as much pasta as eggs.



3 Some people were asked what exercise they liked doing best.
a) What percentage of the people preferred jogging?



It looks like just less than half the people preferred jogging. I will guess 40%.

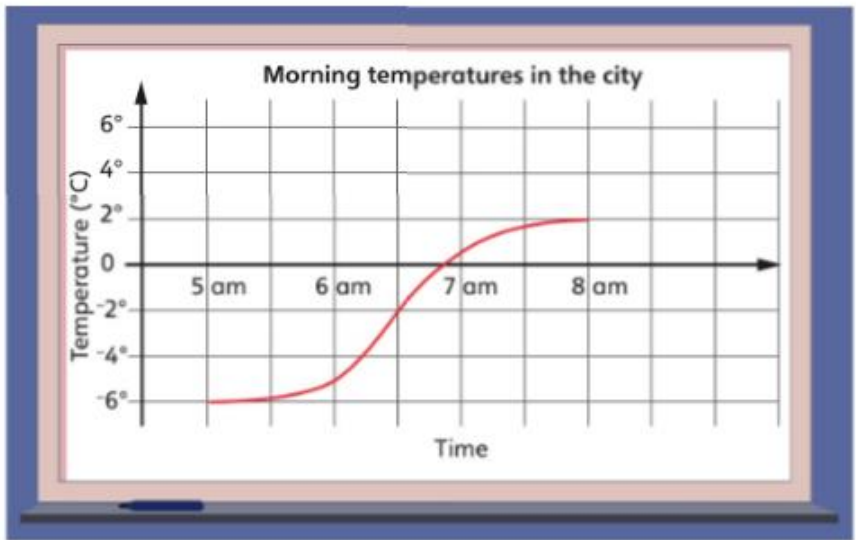
I think there is a way to use the angles to be exact. I know 100% would be 360°. So I can work out what 36° must be.



b) 240 people preferred swimming. How many liked team sports?

Interpreting line graphs

Discover

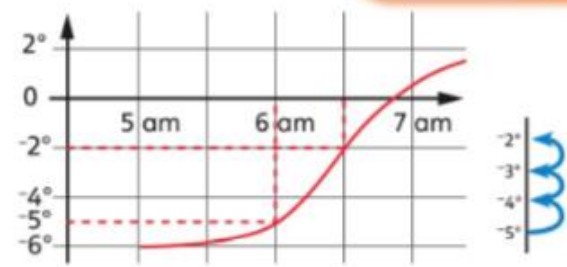


- 1 a) How much did the temperature increase between 6 am and 6:30 am?
- b) Estimate at what time the temperature reached 1 °C.

Share

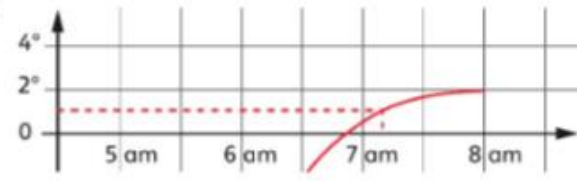
This graph shows temperatures above and below zero. There are values above and below the x-axis.

a)

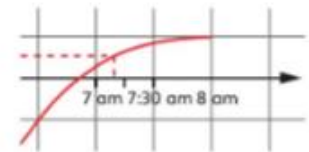


The temperature at 6 am was -5°C .
 The temperature at 6:30 am was -2°C .
 The temperature increased by 3°C .

b)



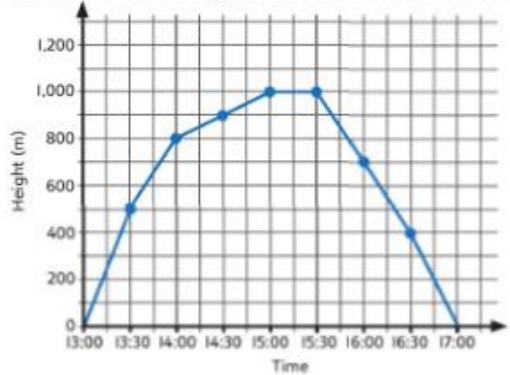
The temperature was 1°C between 7 and 7:30 am.



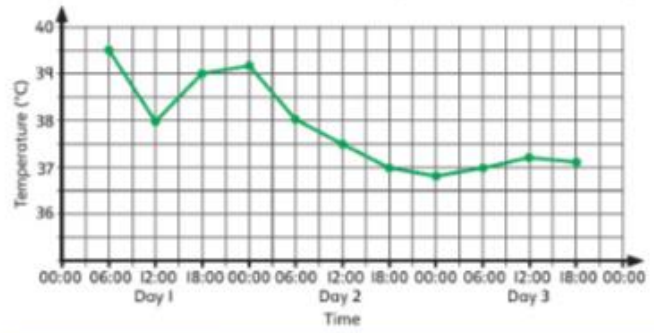
It was 1°C just before 7:15 am. A reasonable estimate would be 7:10 am.

Think together

1 This graph shows the height at which a balloon floated between 13:00 and 17:00. How long did the balloon remain above 500 m?



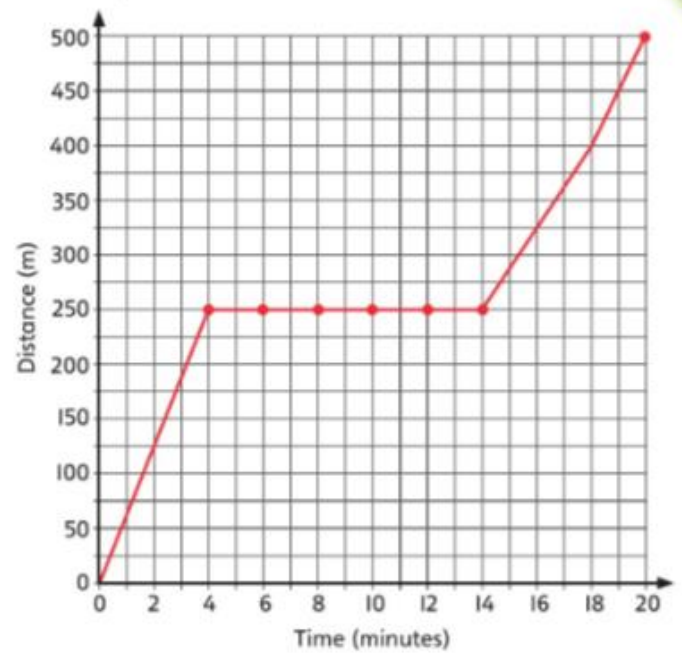
2 Below is a patient's temperature graph. Use the graph to complete the values in the table. Estimate the temperatures as accurately as you can.



Time	9:00 – Day 1	9:00 – Day 2	9:00 – Day 3
Temperature			



3 a) This graph shows the distance Aki walks as he goes to the shop and then back home.



How long does it take Aki to reach the shop? How can you tell?

How long does Aki stay in the shop?

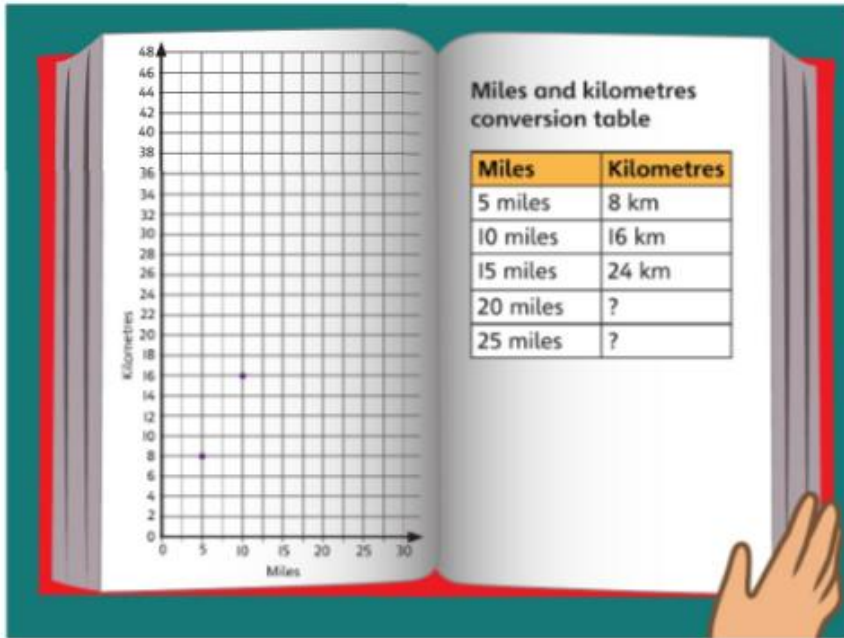
How far is the shop from his home?

b) Andy says: 'I think the graph is incorrect. The last part of the graph should return to 0 km by the end of his journey.'

Explain Andy's mistake.

Constructing line graphs

Discover



- 1 a) Show where the next points would go on the graph and complete the missing values in the table.
- b) How many miles convert to 44 km?

Share

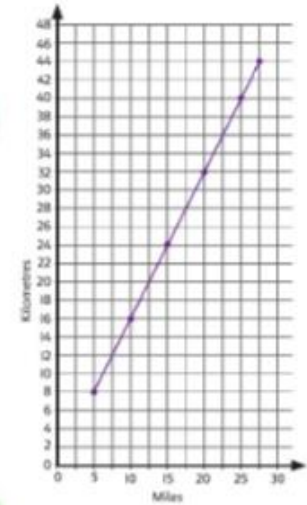
- a) The next point on the graph shows that 15 miles convert to 24 km.

I noticed the points lie in a straight line.



Miles	Kilometres
5 miles	8 km
10 miles	16 km
15 miles	24 km
20 miles	32 km
25 miles	40 km

The graph converts miles and kilometres. It is a straight line because there are 5 miles for every 8 km.



- b) 44 km is halfway between 40 and 48 km.
 27.5 miles is halfway between 25 and 30 miles.
 So 27.5 miles convert to 44 km.

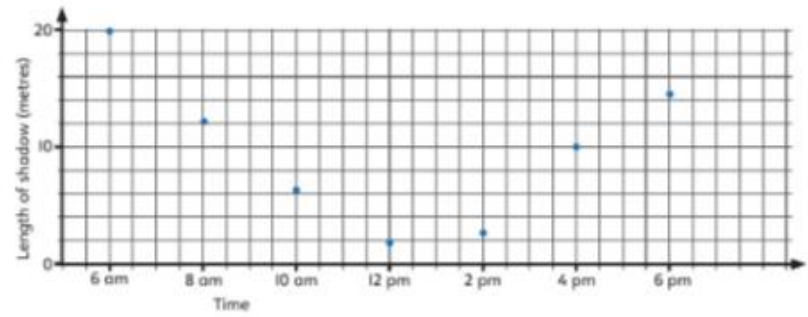
Miles	Kilometres
25 miles	40 km
27.5 miles	44 km
30 miles	48 km

Think together

- 1 This graph shows the conversion of miles and kilometres. Use the information on the graph to complete the conversions.
 10 miles is equivalent to kilometres.
 20 kilometres is equivalent to miles.
 There are metres in one mile.



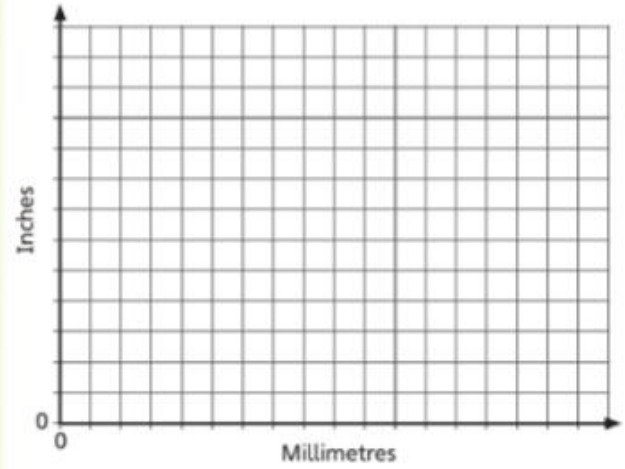
- 2 This graph shows the length of a shadow of a tree at different times of the day.



When was the shadow 10 m long?
 Use this graph to predict the height of the shadow at 8 pm.

- 3 Use the figures in the table to draw a conversion line graph for inches to millimetres.

Inches and millimetres conversion table					
Inches	10	20	30		
Millimetres	254	508	762		



I will first decide what scales to use for my axes.



Use the graph to find the following approximate conversions.

- 25 inches = mm 1 m = inches
- 800 mm = inches 6 ft = m
- 15 inches = cm

There are 12 inches in 1 foot.

