

LINE GRAPHS

Q1.

These two graphs convert pounds (£) to Deutschmarks (Dm) and pounds (£) to dollars (\$).



Use the graphs to complete the table.

number of £	approximate number of Dm	approximate number of \$
0	0	0
200		

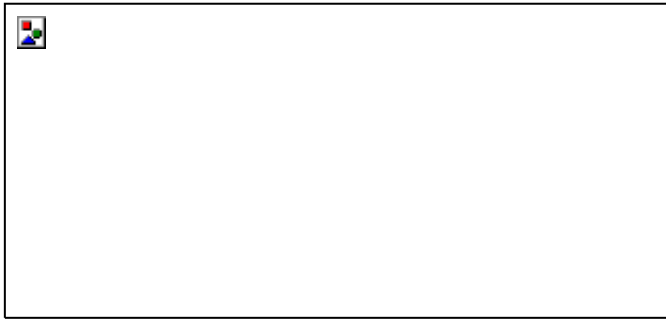
2 marks

Use the information in your table to draw a conversion graph for **\$** into **Dm**.

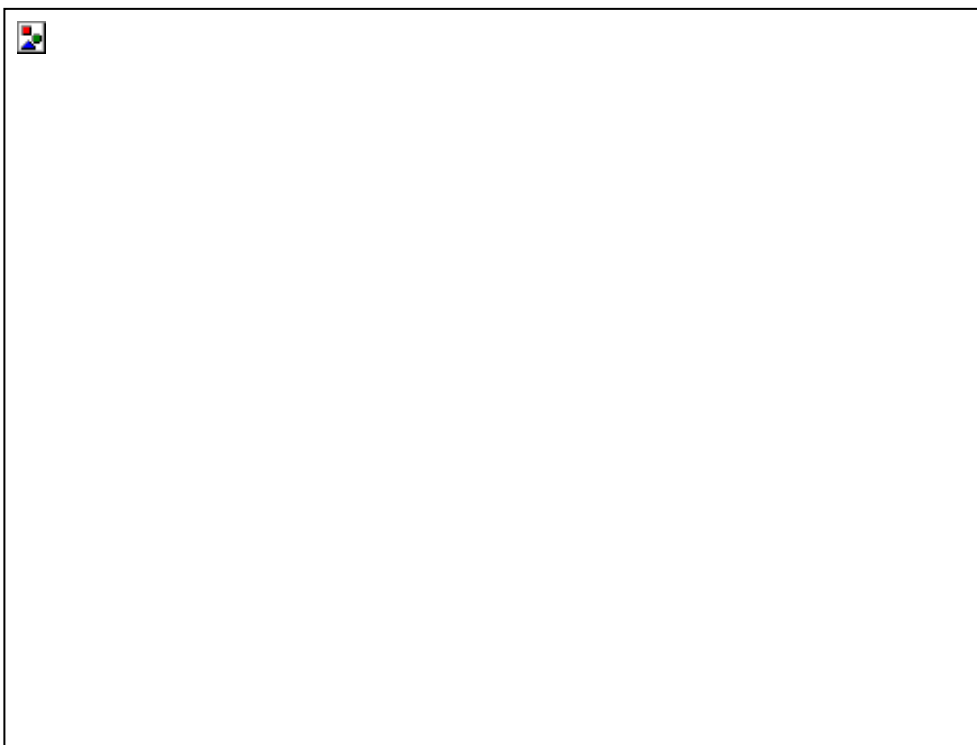


1 mark

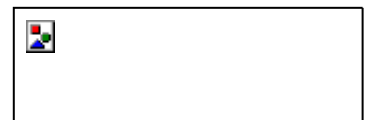
Q2.



This graph shows the height of a balloon at different times.



From the graph, find the height of the balloon at 50 seconds.



1 mark

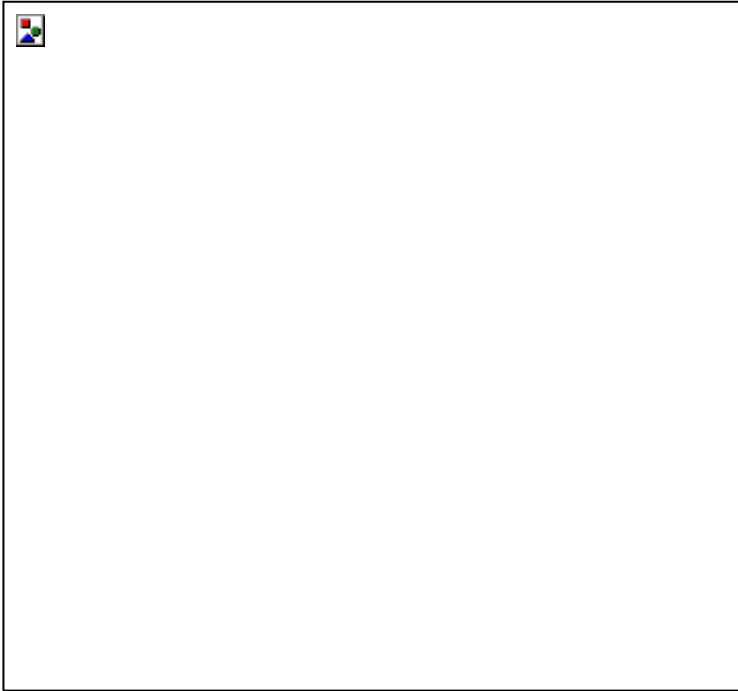
Use the graph to find out how long it took the balloon to rise from 30 metres to 60 metres.



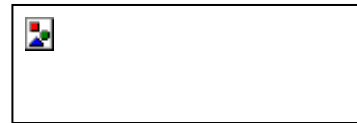
1 mark

Q3.

Jim draws a graph to show how high two rockets go during their flight.

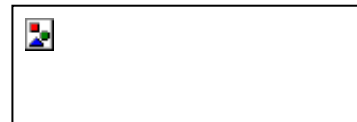


Estimate **how much higher** rocket A reaches than rocket B.



1 mark

Estimate the **time** after the start when the two rockets are at the **same height**.



Jim says,

"The graph shows that rocket A was more than 200 m above the ground for about 23 seconds."

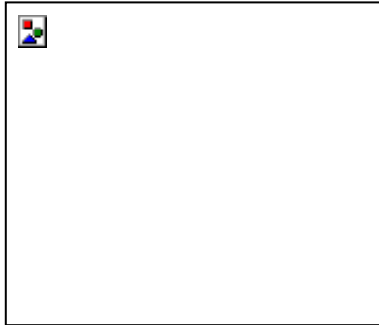
Explain how the graph shows this.



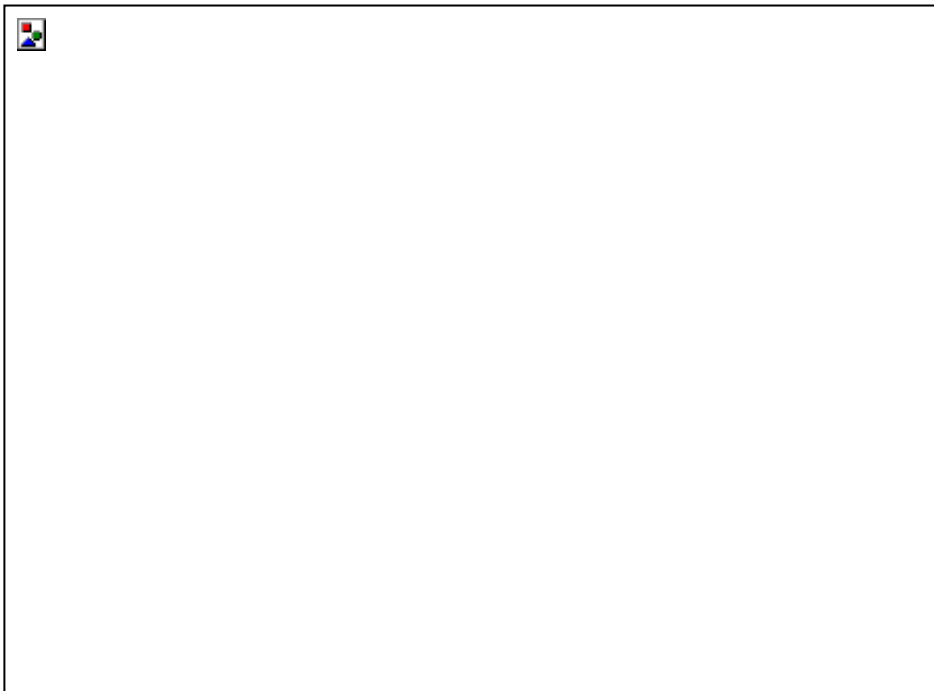
1 mark

Q4.

Gavin was ill in March.



This is his temperature chart.



For how many days was his temperature marked as **more than 37°C**?

1 mark

Which **date** showed the largest **change in temperature** from the day before?

1 mark

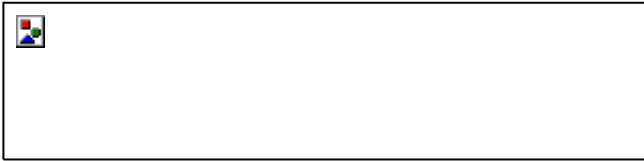
Estimate Gavin's **highest** temperature shown on the graph.

Give your answer to **1 decimal place**.

Q5.

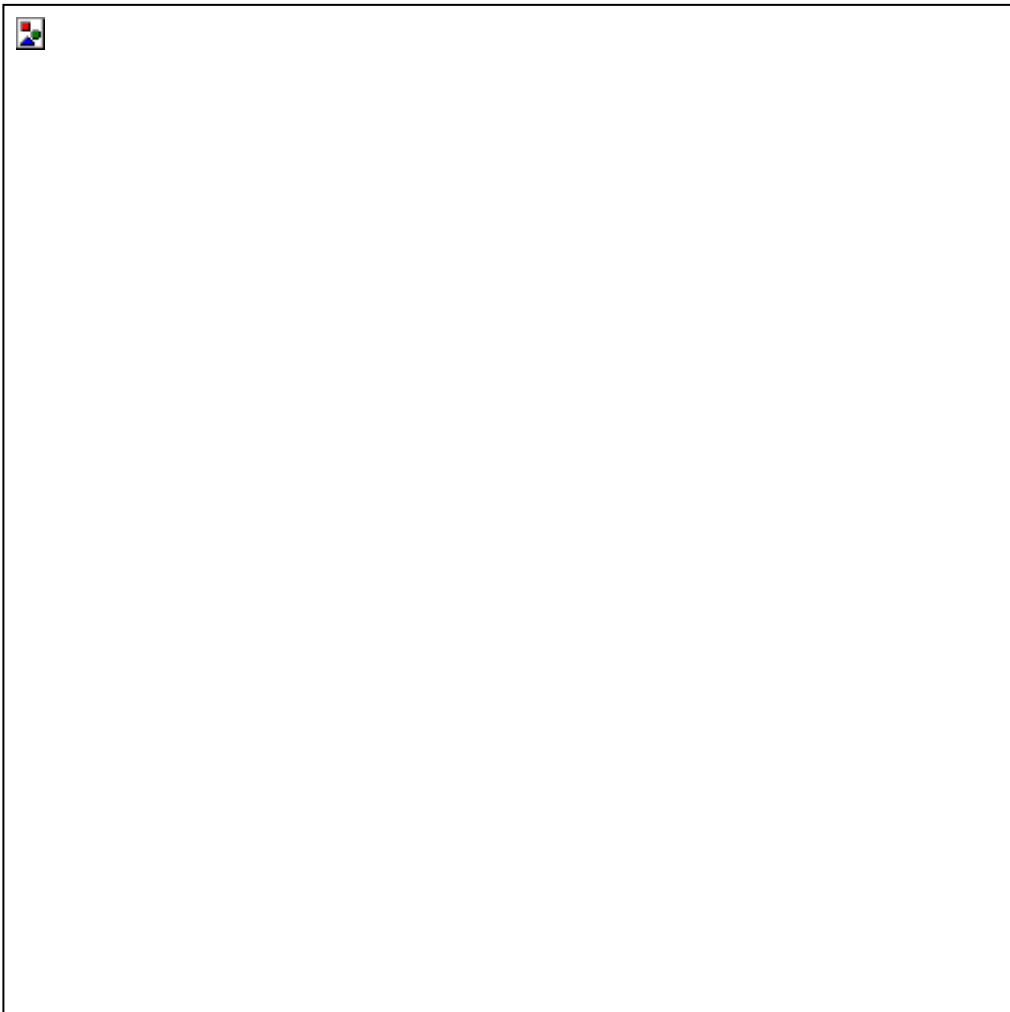
Kevin measures his height in **inches** and then in **centimetres**.

These are his measurements.



The cross on the grid shows Kevin's height in inches and centimetres.

Draw a line on the grid to make a **conversion graph** for **inches** and **centimetres**.



1 mark

Sally is **168cm** tall.

Use the graph to **estimate** Sally's height in **inches**.



1 mark

Q6.

Carol went on a **40-kilometre** cycle ride.

This is a graph of how far she had gone at different times.

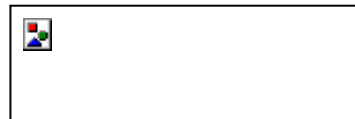


How many minutes did Carol take to travel the **last 10 kilometres** of the ride?



1 mark

Use the graph to estimate the distance travelled in the **first 20 minutes** of the ride.

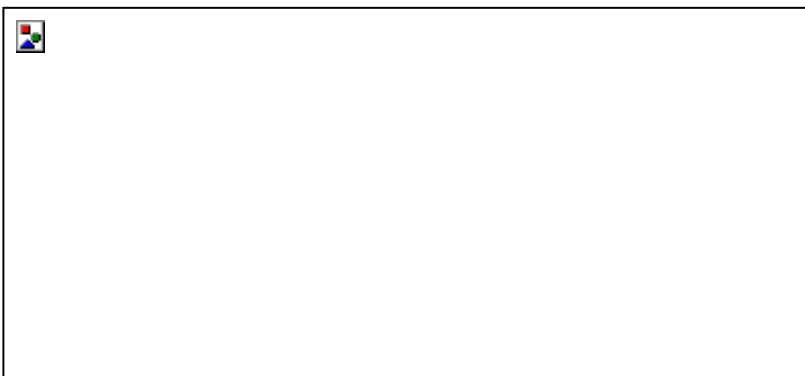


1 mark

Carol says,

'I travelled further in the first hour than in the second hour'.

Explain how the graph shows this.

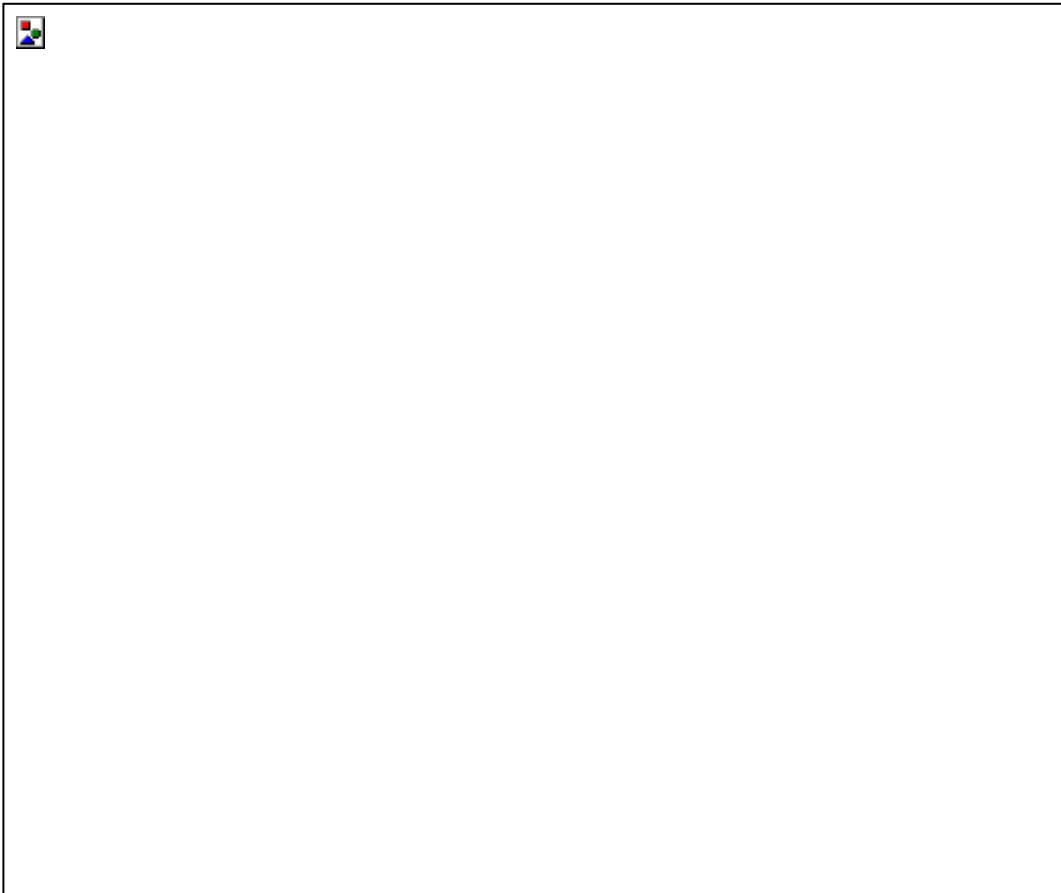


1 mark

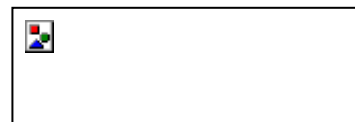
Q7.

Two telephone companies, **Supertalk** and **Quickline**, have different charges for long distance calls.

This graph shows the charges for different lengths of calls.



Estimate from the graph how many seconds longer a **£2** call lasts with **Supertalk** compared to **Quickline**.



1 mark

Estimate from the graph the length of a call when **Quickline** becomes cheaper to use than **Supertalk**.

Give your answer to the nearest 10 seconds.



1 mark

Q8.

This is a graph of a firework rocket, showing its height at different times.

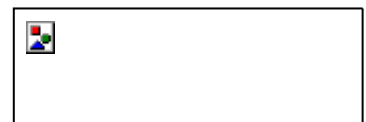


Estimate from the graph for how many seconds the rocket is **more than 20 metres** above the ground.



1 mark

Estimate from the graph how many metres the rocket falls in the **last second** of its flight.



1 mark

Q9.

A hot liquid is left to cool in a science experiment.

This graph shows how the temperature of the liquid changes as it cools.



Read from the graph **how many minutes** it takes for the temperature to reach **40°C**



1 mark

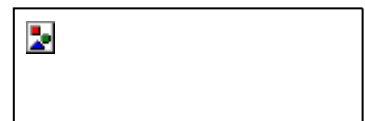
Read from the graph **how many minutes** the temperature is **above 60°C**



1 mark

Q10.**150 people** take part in a walk.

This chart shows the number of people still walking at different times.

Use the chart to estimate the **time** when **two-thirds of the people** are still on the walk.

1 mark

What **percentage** of the people who started are **still on the walk at 3pm**?

Q11.

This graph shows how the weight of a baby changed over twelve months.



From the graph, what was the weight of the baby at **10 months**?

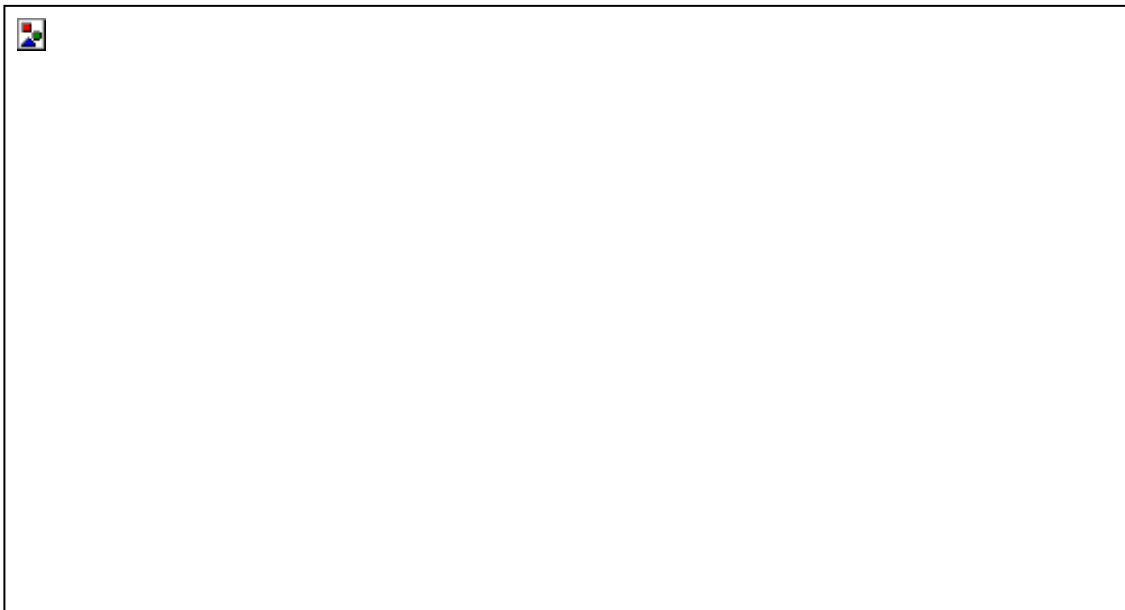
1 mark

How much **more** did the baby weigh at 5 months than at birth?

1 mark

Q12.

This graph shows the cost of phone calls in the daytime and in the evening.



How much does it cost to make a **9 minute** call in the **daytime**?

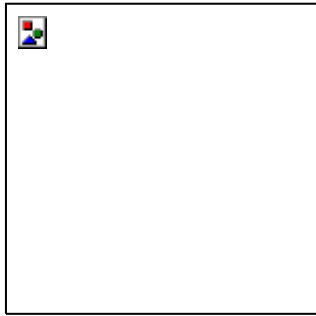
1 mark

How much **more** does it cost to make a **6 minute** call in the **daytime** than in the **evening**?

1 mark

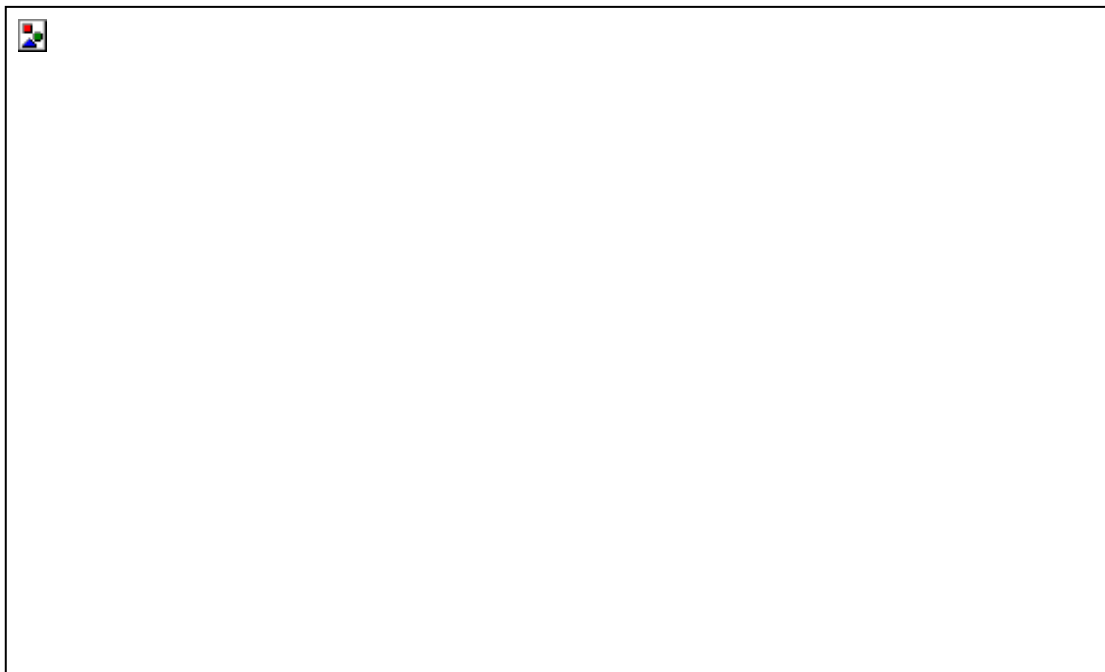
Q13.

The London Eye is a big wheel with pods to carry passengers.



It takes 30 minutes for the wheel to make a complete turn.

This graph shows the height of a pod above the ground as the wheel turns.



How long from the start does it take the pod to reach a height of 75 metres?

1 mark

How many metres above the ground is the pod at its highest point?

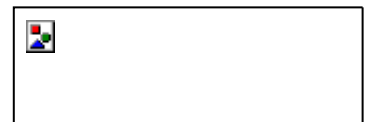
1 mark

Q14.

This graph shows the temperature in a greenhouse.



Use the graph to find the time when the temperature was 25°C.



1 mark

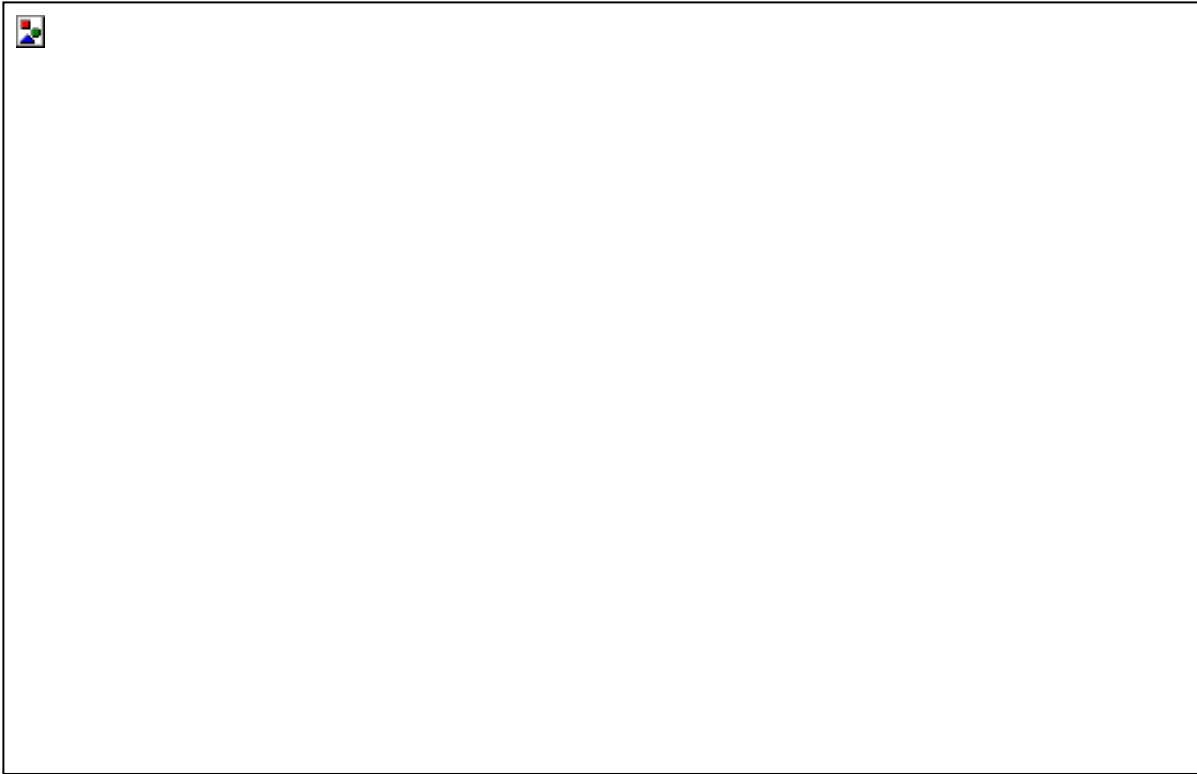
Use the graph to find the difference between the temperature at 2pm and the temperature at 4pm.



1 mark

Q15.

This graph shows the outside temperature from 4pm to 10pm on a day in winter.



At what time was the temperature -2°C ?

A small empty rectangular box for the answer to the question. A small icon of a person with a speech bubble is in the top-left corner.

1 mark

How many degrees did the temperature drop from 5pm to 7pm?

A small empty rectangular box for the answer to the question. A small icon of a person with a speech bubble is in the top-left corner.

1 mark

Q16.

This graph shows the number of people living in a town.



Look at the graph.

How many people lived in the town in 1985?

1 mark

In which year was the number of people the same as in 1950?

1 mark

Find the year when the number of people first went below 20,000

1 mark

Q17.

500 children started a 20 kilometre sponsored cycle ride.

This graph shows how far they cycled.



At what distance were exactly half of the children still cycling?

1 mark

Estimate how many children completed the 20 kilometre cycle ride.

1 mark

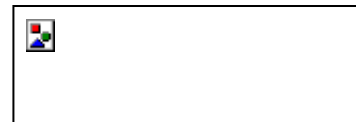
Q18.

This chart shows the population of Cornwall from 1950 to 2010.



Look at the chart.

In which year did the population first reach 400,000?



1 mark

How much did the population increase from 1950 to 2000?



1 mark

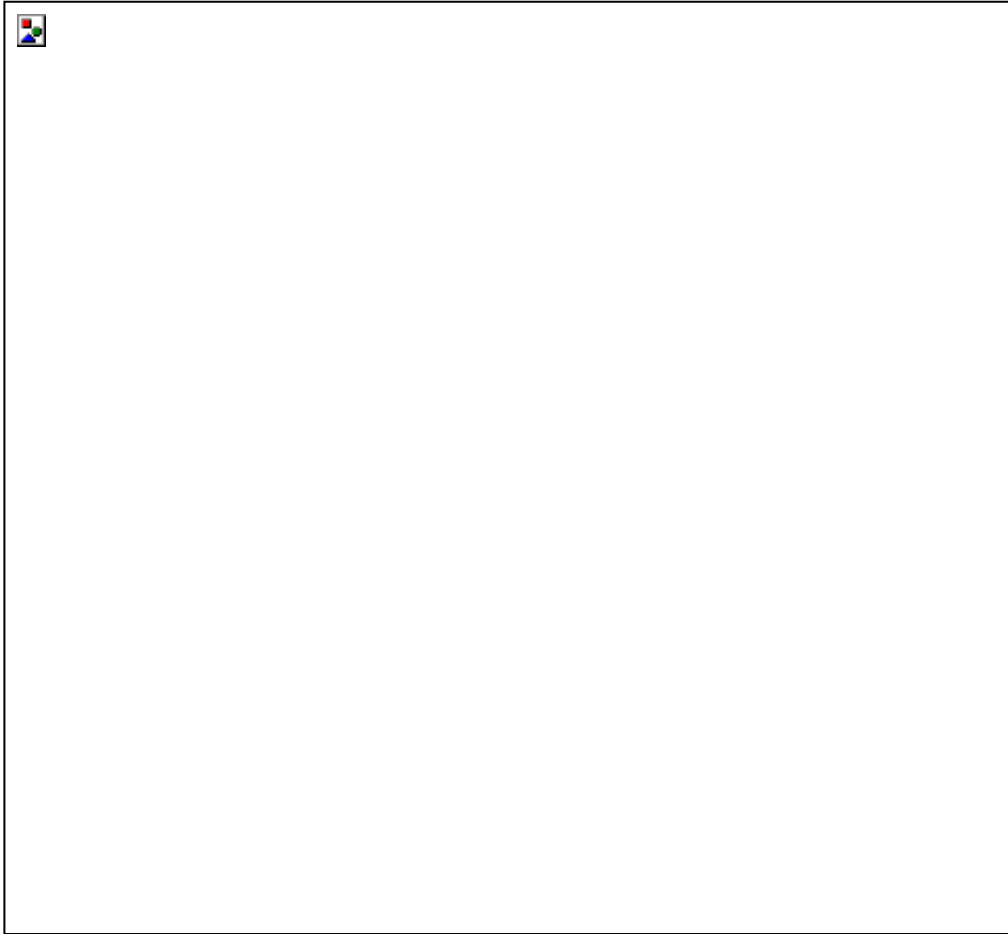
What was the population of Cornwall in 2010?



1 mark

Q19.

Nik uses this graph to change between pounds (£), dollars and euros.



Use the graph to work out the missing numbers below.

The first one is done for you.

£70	is about the same as	84 euros
£70	is about the same as	_____ dollars
120 dollars	is about the same as	£_____
120 euros	is about the same as	_____ dollars

2 marks

Q20.

The graph shows the average heights of girls in the UK from age 6 – 11 years.



Emily is **1.38 m** tall.

She is the **average** height for her age.

How old is she?



1 mark

Zoe is  **years old.**

She is also 1.38 m tall.

How much taller than average is she?

Give your answer in centimetres.



1 mark

Q21.

How fast you can type accurately is called your typing speed.

The regions of the graph show information about different typing speeds.



Darren's level of typing is **elementary**.

In **20 minutes** he should be able to type between 500 and 700 words.

Jo's level of typing is **intermediate**.

How many words should she be able to type in **20 minutes**?

Between _____ and _____

1 mark

Kath's typing speed is **30 words per minute**.

What level is Kath's typing?



Advanced



Intermediate



Elementary



Beginner

Explain how you know.

1 mark

Q22.

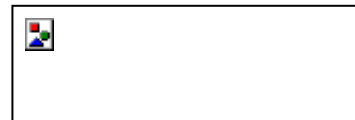
Kirsty measured the length of her shadow every hour on one sunny day.

She plotted her results on this graph.



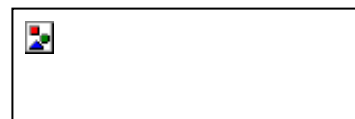
Look at the graph.

Estimate the length of Kirsty's shadow at 3:30pm.



1 mark

Estimate a time when her shadow was 180 centimetres long.

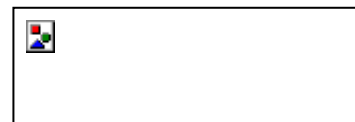


Q23.

This graph shows the distance Alfie and Chen walked in an afternoon. They started at 1:45pm and had two breaks.

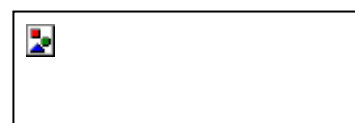


How many kilometres did they walk **between** the first and second breaks?

A small empty rectangular box for the answer. In the top-left corner of the box, there is a small icon consisting of four colored squares (red, green, blue, and yellow) arranged in a 2x2 grid.

1 mark

At what time did Alfie and Chen start their second break?

A small empty rectangular box for the answer. In the top-left corner of the box, there is a small icon consisting of four colored squares (red, green, blue, and yellow) arranged in a 2x2 grid.

1 mark

Q24.

Two companies sell toys online. They charge to deliver.

Describe the delivery cost of the second company.

The first company is done for you.



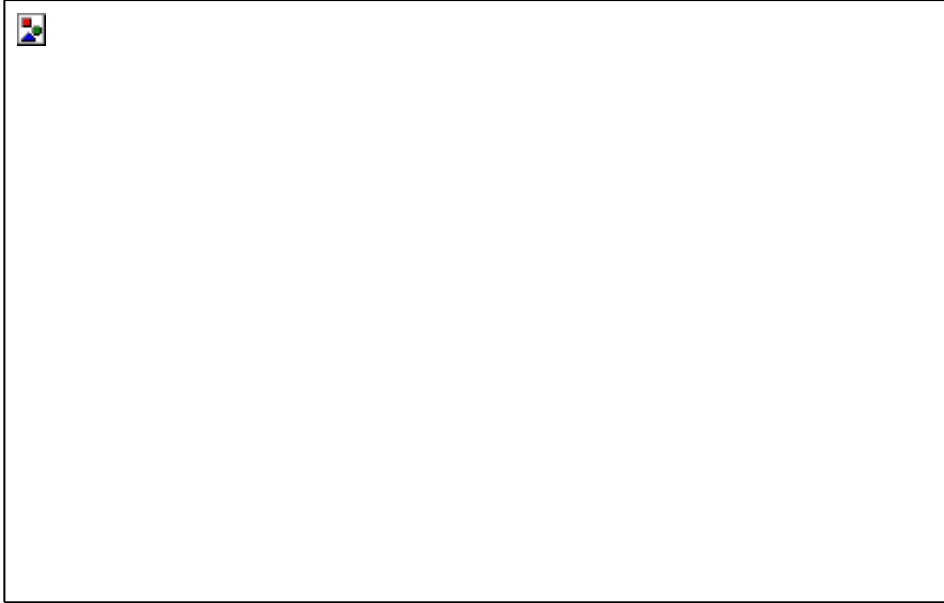
1 mark

Q25.

Alfie and his brother walked from home to their school.

Their school is 2 kilometres from home.

The graph shows information about **Alfie's** journey.



- (a) How does the graph show that Alfie walked at a **constant speed** for all of his journey?

1 mark

- (b) Alfie's brother left home **10** minutes **before** Alfie.

He arrived at school **20** minutes **after** Alfie.

He walked at a **constant speed** for all of his journey.

At what time did Alfie overtake his brother?



1 mark

Q26.

This graph shows how the temperature changed in Liam's room one afternoon.



Estimate the temperature at 3:15pm.

A small icon of a person with a speech bubble, located in the top-left corner of the answer box.

1 mark

Estimate the time when the temperature was highest.

A small icon of a person with a speech bubble, located in the top-left corner of the answer box.

1 mark

How much did the temperature change from 2pm to 2:30pm? Give your answer to the **nearest degree**.

A small icon of a person with a speech bubble, located in the top-left corner of the answer box.

1 mark

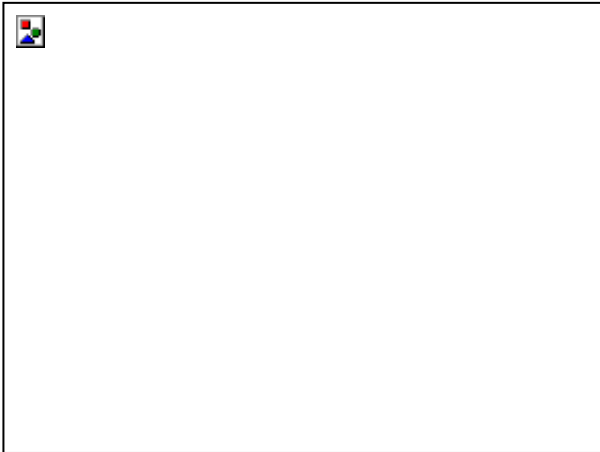
M1. (a) Number of DM in the range 630 to 670, **inclusive**.

1

(b) Number of \$ in the range 270 to 280, **inclusive**.

1

(c) Correct drawing of line **through origin** and point plotted according to answers given in (a) and (b), eg:



*To be awarded the mark, the point must be correctly plotted (within range described below) **AND** the line must pass through both the origin and the point. The point must be plotted within $\pm 20\text{DM}$ and $\pm \$10$ of the answers given in (a) and (b)*

1

[3]

M2. (a) Answer in the range 46 m to 47 m inclusive

1

(b) 55

1

[2]

M3. (a) Any answer in the range 145m to 175m inclusive.

1

(b) A time in the range 27 to 29 seconds inclusive.

1

(c) Evidence of awareness that the time interval between the points where the 200m line cuts the graph for rocket A has been used, eg:

- “He could have checked when the rocket went above 200m and when it went under 200m and worked out the time between.”
- “Look how high it goes until it gets to 200m then look along the horizontal line until it drops below 200m.”

An appropriate drawing on the graph, identifying the intersection of the 200m line with the curve is acceptable a part of explanation, eg, award mark for:

- **“Subtract the two dots”** if dots are marked indicating correct intersections.
Do not accept vague statements or ones which only repeat information, eg:
- **“You can draw the graph then draw the things then work it out.”**
- **“Because on the graph the rocket is above 200m for 23 seconds.”**

1

[3]

M4. (a) 9

1

(b) 8th of March

*Accept 8
Accept ‘7th – 8th’ or similar.
Do not accept 7th.*

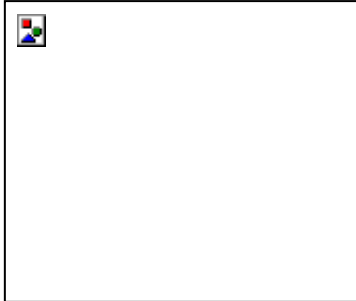
1

(c) 39.1 **OR** 39.2

1

[3]

- M5.** (a) Straight line drawn on the graph from the origin to the given point or beyond.



*The line drawn must be straight **AND** connect the given point with the origin.*

Accept a straight line which misses the given point and/or the origin by up to 1 mm.

1

- (b) Answer in the range of 65 to 67 inclusive **OR** answer consistent with the line drawn on graph in **2a**.

Accept answers apparently based upon calculation, provided the answer lies within the given range.

1

[2]

- M6.** (a) 40

1

- (b) Answer in the range 12 to 13km inclusive.

1

- (c) An explanation which indicates that after 1 hour she has travelled more than 20km and/or she has travelled less than 20km in the second hour, eg

- 'She did about 40 km and it was about 22 in the first hour';
- 'Half and half would be 20-20, but she does more than 20 then less than 20';
- 'It goes to 23 in the first hour'.

Do not accept vague or arbitrary explanations, eg

- 'She got tired in the second half';
- 'It's marked on the graph';

- *'There's more crosses in the first hour than the second';*
- *'The gaps are further apart'.*

1

[3]

M7. (a) Answer in the range 250 to 270 inclusive.

1

(b) Answer in the range 460 to 480 inclusive.

1

[2]

M8. (a) Answer in the range 5.9 to 6.2 seconds inclusive.

1

(b) Answer in the range 17.5 m to 18.5 m inclusive.

1

[2]

M9. (a) Answer in the range 18 minutes to 19 minutes inclusive.

1

(b) Answer in the range 6 minutes to 7½ minutes inclusive.

1

[2]

- M10.** (a) Answer in the range 12:30pm to 1:00pm exclusive.
Accept answers with or without 'pm'.

1

- (b) Award **TWO** marks for the correct answer of  % **OR** 26.6%
Accept 26.6% OR 26.7% OR 26.6 ... % OR 27%
*Accept for **ONE** mark 26%*

If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, eg

$$40 \div 150 \times 100$$

Answer need not be obtained for the award of the mark.

Up to 2

[3]

- M11.** (a) Any value in the range 8.6 to 8.8 inclusive.

1

- (b) Any value in the range 3.2 to 3.4 inclusive.

1

[2]

- M12.** (a) Answer in the range 44p to 46p inclusive.

1

- (b) 20p

Accept £0.20p OR £0 20

***Do not** accept 0.20p OR £20p*

1

[2]

- M13.** (a) Answer in the range 7.5 minutes to 9 minutes exclusive.
Accept an answer in the range 21 minutes to 22.5 minutes exclusive. 1
- (b) Answer in the range 130m to 140m inclusive. 1
- [2]**

- M14.** (a) Answer in the range 3:10pm to 3:20pm inclusive. 1
- (b) Answer in the range 13 degrees to 14 degrees inclusive.
The answer is a specific time (see page 5 for guidance). 1
- [2]**

- M15.** (a) Answer in the range of 8:40pm to 8:50pm inclusive
The answer is a specific time 1
- (b) 3
Do not accept –3 1

- M16.** (a) 25000

Accept answers in the range 24500 to 25500 inclusive.

1

(b) 1996 **OR** 1997 **OR** 1998

1

(c) 1963 **OR** 1964

1

[3]

M17. (a) 16

1

(b) A whole number in the range 180 to 190 inclusive

1

[2]

M18.(a) 1974 **OR** 1975 **OR** 1976

1

(b) A whole number answer in the range 130 000 to 180 000 **inclusive**.

1

(c) A whole number answer in the range 510 000 to 550 000 **exclusive**.

Do not accept 510 000 OR 550 000

1

[3]

M19. 105 $\pm$ 1

then

80 $\pm$ 1

1

150 $\pm$ 1

1
U1

[2]

M20. (a) 10 years old

1

(b) 3 cm

Accept answers in the range of 2.9 – 3.1 inclusive

! Change of unit, eg 0.03 m

Condone, provided cm is replaced by m

1

[2]

M21. (a) Gives both correct values, ie

700 (or 701) and 1000 (or 999)

(in either order)

1

(b) Indicates Elementary and gives a correct explanation that places the speed clearly within the correct section on the graph, eg:

- 30 words in one minute is 300 words in ten minutes
- 30 wpm = 900 words in 30 minutes
- Darren is between 25 and 35 words per minute so she is the same as Darren

Accept minimally acceptable explanation, eg:

- 300 every 10
- Point equivalent to 30 words per minute (eg 300 words in 10 minutes) clearly indicated on the graph
- 25-35, same as Darren
- $20 \times 30 = 600$

! Small number of minutes used, where regions are closer together

Accept points equivalent to 30 words per minute where the number of minutes is 2.5 or greater

eg, accept



- 30 words in one minute is 75 words in  minutes
- eg, do not accept
- I looked at 1 minute on the graph and found where 30 words is on the graph

Do not accept incomplete explanation, eg:

- I read up from 10 minutes
- Between 25 and 30 words per minute
- Same as Darren

1
U1

[2]

M22. (a) Answer in the range 125 cm inclusive to 140 cm exclusive

Do not accept 140 cm.

1

(b) Answer in the range 9:30 am to 9:50 am inclusive

Accept an answer in the range 4:30pm to 4:50pm inclusive.

1

[2]

M23.(a) 4 km

1

(b) 4:15pm

The answer is a specific time

1

[2]

M24. Gives a correct description that indicates the delivery cost is constant, eg:

- The delivery cost is always £5
- The cost is always £5 no matter how much the toy costs
- Delivery stays the same as the cost of toy increases

Accept minimally acceptable explanation, eg:

- It is £5

Accept omission of the actual delivery cost, eg:

- *It always costs the same*
- *The cost is the same*
- *The cost of the toy does not affect the delivery cost*
- ! *Condone correct response with the pound sign omitted, eg:*
- *It is always 5*
- ! *Condone explanations which refer to toys costing up to £20*
- Do not accept** *incomplete or ambiguous explanation, eg:*
- *They are equal amounts*

[1]

M25. Gives a correct interpretation of the graph, eg:

- *It is a straight line*
- *It goes up steadily*
- *The angle of the line stays the same*

- *The gradient of the line is constant*

Accept minimally acceptable explanation, eg:

- *It is straight*
- *It doesn't bend*
- *It is a diagonal*

Do not accept *incomplete or ambiguous explanations that do not sufficiently imply a constant speed and / or do not demonstrate the relationship holds for the entire graph, eg:*

- *The line goes straight up*
- *It is not wobbly*
- *It is level*
- *Every 5 mins he walks the same distance*
- *He walks 1km in the first 15 mins and 1km in the second 15 mins*

! *Values read from graph*

Accept, provided it is clear the relationship holds for the entire graph.

Values should be accurate within +/- 0.1km and / or +/- 2 minutes, eg:

- 0.7km every 10 minutes
- Every 7.5 minutes he walks about half a km

! Calculation of kilometres per hour

Accept values in the range 3.7 to 4.3km per hour inclusive.

1

(b) 08:10

! Accept values between 08:09 and 08:11 inclusive

! Time

1

[2]

M26.(a) Accept answers in the range 22.2 to 22.8 exclusive.

Do not accept 22.2 or 22.8

1

(b) Accept answers in the range 2:48pm to 2:52pm inclusive.

The answer is a specific time.

1

(c) 5

1

[3]