



Aberdare Community School
Mathematics Department

WJEC GCSE

Higher – Calculator

Algebra

Interpret real life graphs

Name:

Set:

Date:

Teacher:

7. You will be assessed on the quality of your written communication in this question.

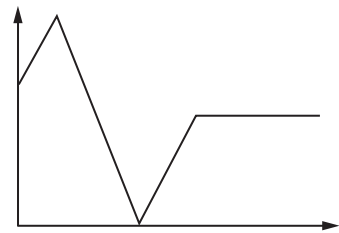
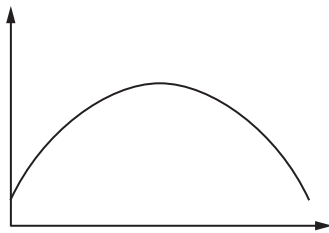
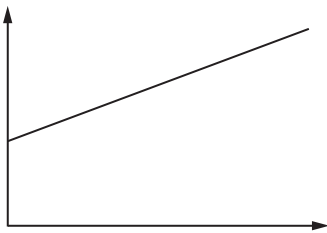
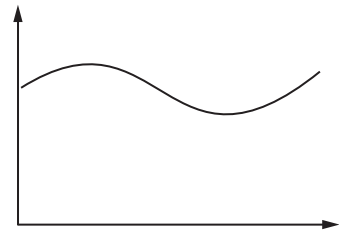
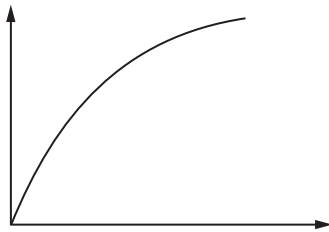
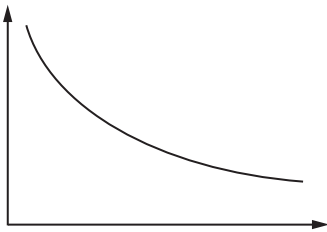
Michelle has cut out two headlines and a number of graphs from newspapers. She has cut off the labels and scales from the graphs so that she is left with simple sketches of the original graphs.

Each headline originally had a matching graph.

Headlines

- More ice creams are sold in the summer than in the winter in South Wales.
- Vast increase in sales of bicycles in the South East of England.

Michelle's sketches of the graphs



On the opposite page, for **each** of the headlines

- select an appropriate sketch from above and draw it in the box opposite,
- label the axes,
- explain why the graph matches the headline.

- More ice creams are sold in the summer than in the winter in South Wales.

Graph



Explanation

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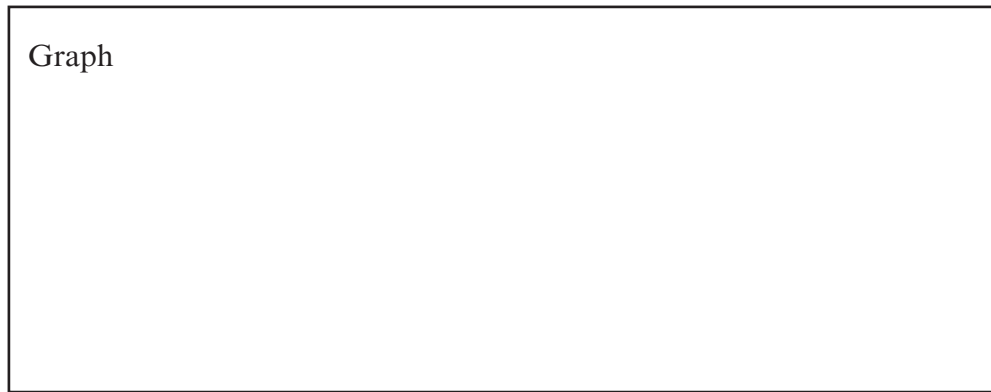
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- Vast increase in sales of bicycles in the South East of England.

Graph



Explanation

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14. As the sea comes in and out we have low tide and high tide.
At low tide, the depth of water in a harbour is 3 metres and at high tide the depth is 15 metres.
The tide takes approximately 6 hours to come in to high tide, and approximately 6 hours to go out to low tide.
Starting at low tide, $\frac{1}{12}$ of the tidal range comes in during the first hour, a further $\frac{1}{6}$ comes in during the second hour, a further $\frac{1}{4}$ during the third hour, a further $\frac{1}{4}$ during the fourth hour, a further $\frac{1}{6}$ during the fifth hour, and finally a further $\frac{1}{12}$ comes in during the sixth hour.
The pattern for the tide going out is the same in reverse.

(a) Draw a graph to show the approximate heights of the tides over **24 hours**. [6]

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(b) Estimate the height of the tide $4\frac{1}{2}$ hours after low tide.

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[2]

(c) State the period of your graph and state how you know this.

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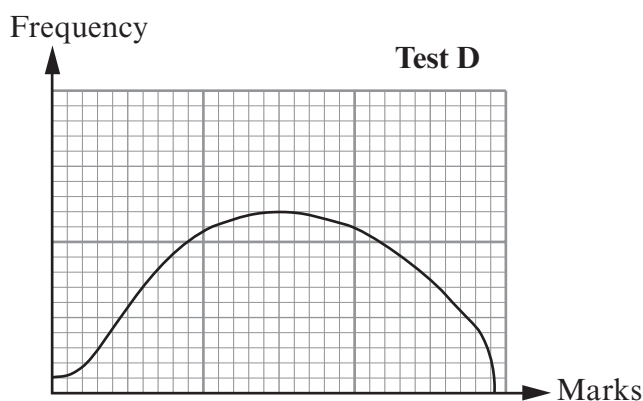
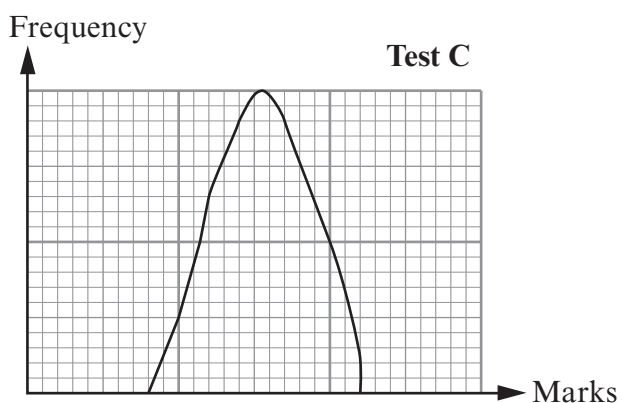
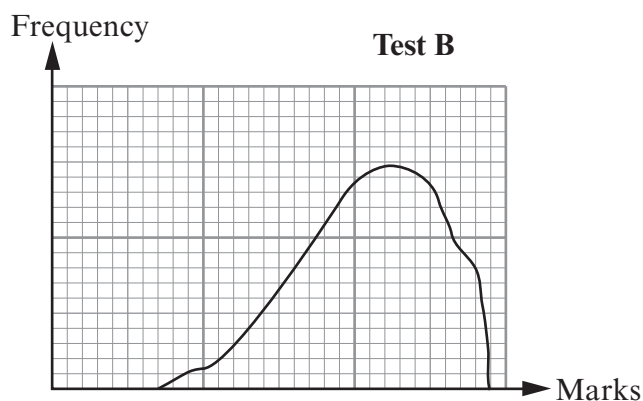
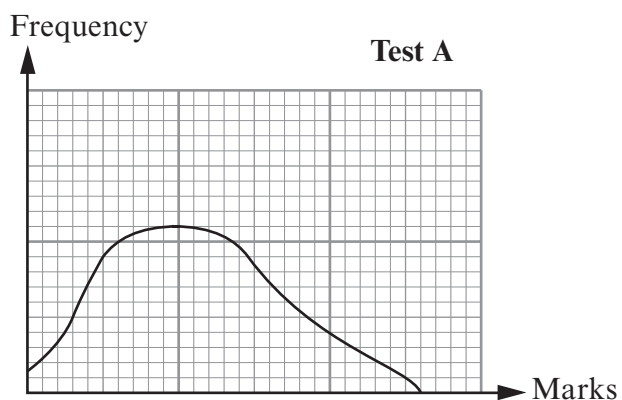
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[2]

5. A group of students sat four separate tests, Test A, Test B, Test C and Test D, as part of their course.

Using the data from the marks scored in each of these tests the following sketch graphs were drawn. The same scales are used in each graph.



Complete the following statements.

“Most of the students gained high marks in Test” .”

“The range of students’ marks was smallest in Test” .”

“Most of the marks were low in Test” .”

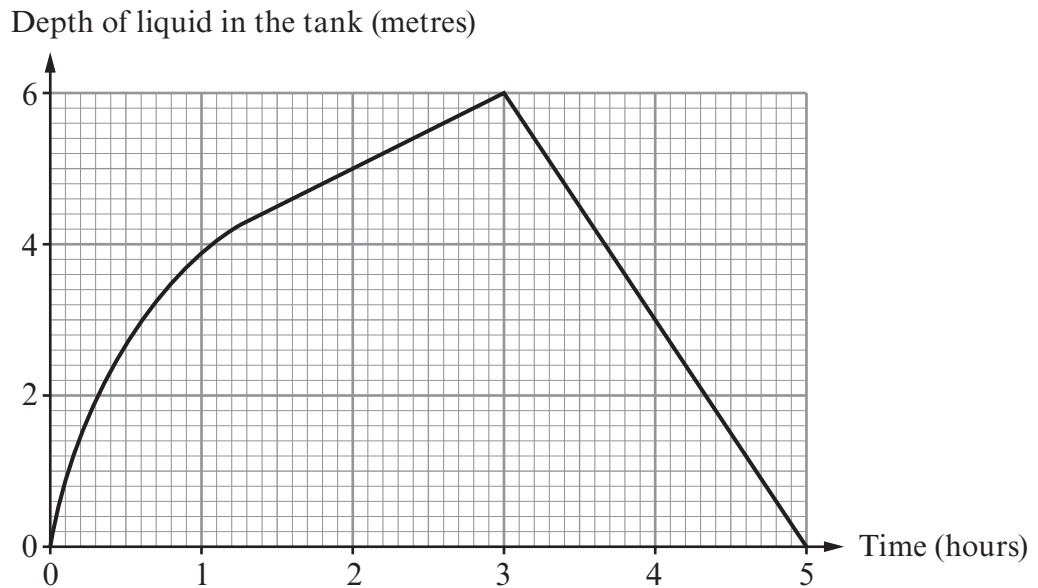
[3]

7. A chemical factory makes a liquid that is used in the production of a waterproof fabric. A cylindrical tank is used to collect the liquid made in the factory.

The moment the tank is full, it starts to empty the liquid into a tanker in readiness for delivery to a company which makes the waterproof fabric.

This process is continuous during the week, but the production stops at weekends for maintenance.

The graph shows the process of the tank being filled and emptied into the tanker.



- (a) What is the depth of the liquid in the tank $2\frac{1}{2}$ hours into the process?

..... metres

[1]

- (b) How long, in minutes, does it take to half fill the cylindrical tank?

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[2]

12. A ball is dropped vertically from a height of 10 metres onto a smooth horizontal surface. After each bounce the ball reaches a height equal to 70% of its previous height.

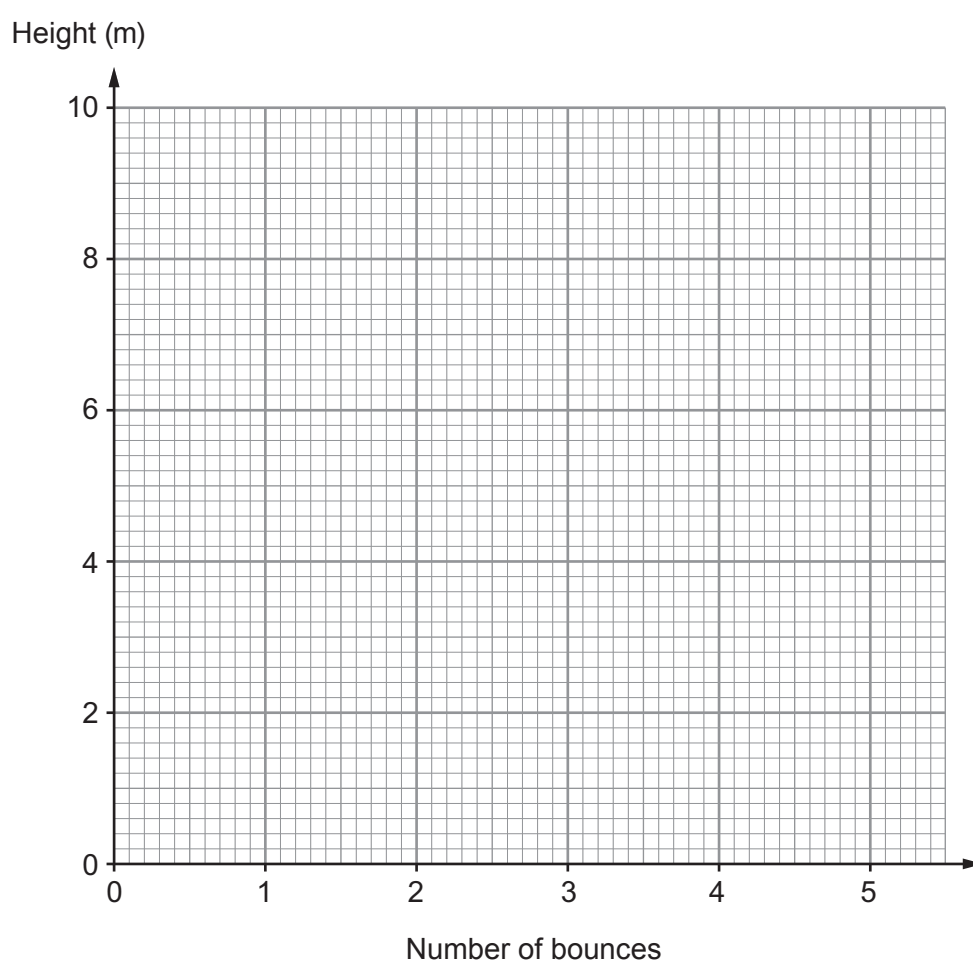
- (a) On the graph below, plot the height the ball reaches after each bounce, up to and including the fifth bounce. [4]

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- (b) Explain clearly why you should **not** connect the points you have plotted on the graph. [1]

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12. (a) A substance **loses** $\frac{1}{4}$ of its mass every second.

Its initial mass is 2500 grams.

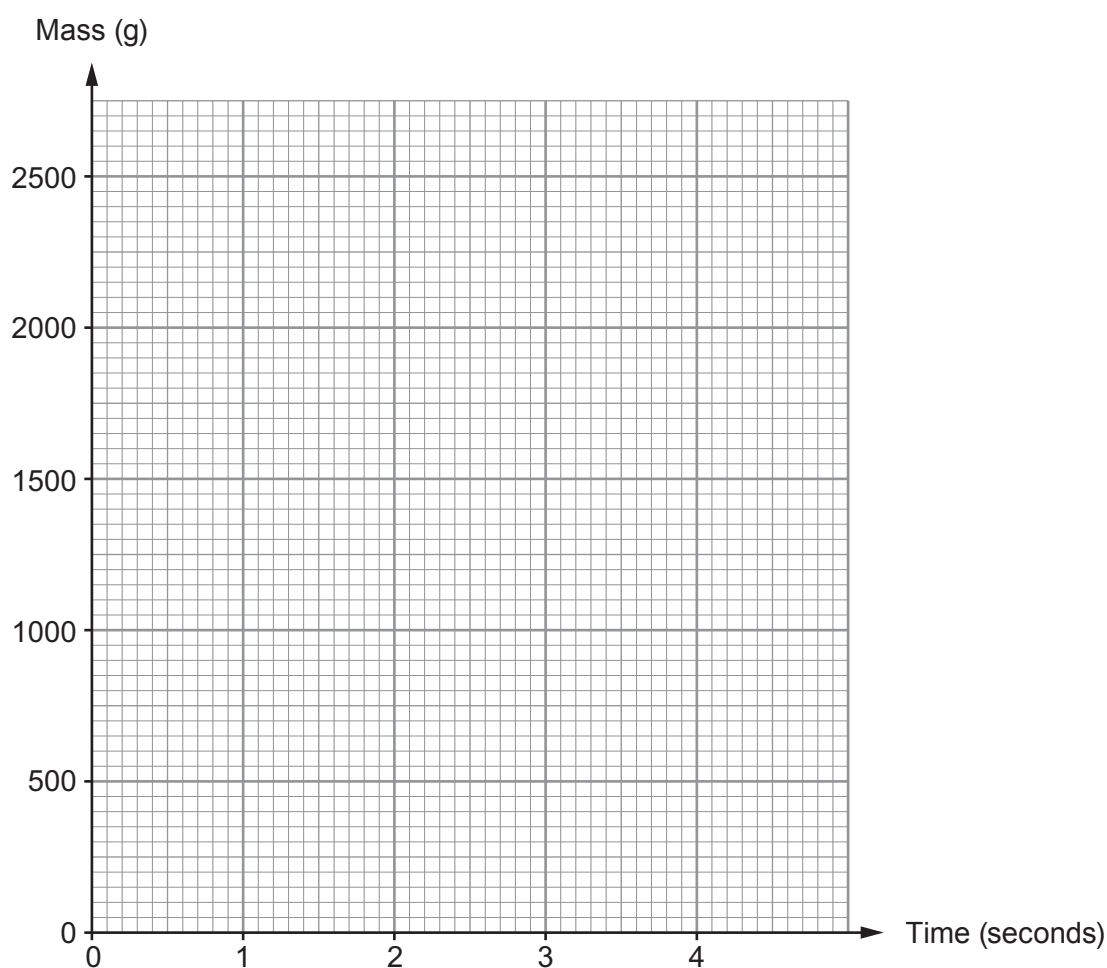
- (i) Use the graph paper below to draw a graph showing the decreasing mass during the first 4 seconds. [3]

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- (ii) After how many seconds will the mass be 1500 grams? [1]

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- (b) A substance has an initial mass m grams.
It loses a quarter of its mass every second.
Write down a formula for finding the final mass, f grams, of the substance after 5 seconds.

Examiner
only

[3]

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