

You have one week to complete this. What you hand in should be your best work, and you must attempt every question.

If you are stuck then please either consult notes or textbooks, attend a workshop, or ask your teacher.

You may need to refer to the formula book, found [here](#):



or financial information, found [here](#):



- 3) Jasmin wants to borrow £150 from a lender offering loans at an APR of 25% if she pays back the loan in two equal repayments, the first at the end of one year and the second at the end of two years.
- (a) Find the amount of each repayment. (3 marks)
- (b) A different lender offers the loan for a single payment of £200 at the end of two years. What is the APR in this case? (4 marks)

- 4) Ryan works in quality control at a biscuit factory. He checks the weights of 50 packets of biscuits.

Weight, $g$ (grams)	Frequency
$230 \leq g < 234$	1
$234 \leq g < 238$	6
$238 \leq g < 242$	23
$242 \leq g < 246$	17
$246 \leq g < 250$	3

- (a) Work out an estimate of the mean weight of biscuits in these packets. [4 marks]
- (b) The biscuit manufacturer claims that the average weight of a packet of these biscuits is 240 grams.

Does this seem a reasonable claim?  
Give a reason for your answer.

[1 mark]

- 1) Circle the type of correlation, if any, you would expect between 'the number of years a monarch reigned' and 'the age at which the monarch died'.

[1 mark]

A sports coach analyses the goal scoring record of a large sample of Premier League Football players over a season.

Part of his analysis involves calculating values for the Product Moment Correlation Coefficient ( $r$ ).

- 2) (a)  $r = +0.65$  between number of shots on goal and goals scored.

This is probably correct.

Explain why.

- (b)  $r = -0.83$  between boot size and goals scored.

This is probably incorrect.

Explain why.

- (c)  $r = -1.14$  between age and goals scored.

This is definitely incorrect.

Explain why.

- 5) The table shows the heights,  $x$  cm, and the arm spans,  $y$  cm, of a random sample of 12 men aged between 21 years and 40 years.

$x$	152	166	154	159	179	167	155	168	174	182	161	163
$y$	143	154	151	153	168	160	146	163	170	175	155	158

- (a) Calculate the value of the product moment correlation coefficient between  $x$  and  $y$ .  
[3 marks]
- (b) Interpret, in context, your value calculated in part (a).  
[2 marks]

- 6) Look at the three graphs on the answer sheet

A newspaper used these three graphs to show some claimed effects of global warming.

### Global changes

- (a) If 'Sea ice extent' and 'Land surface air temperature' were plotted as a scatter graph, what correlation would there be?

Circle your answer.

[1 mark]

- (b) What is misleading about presenting these three graphs together as shown on the Data Sheet?

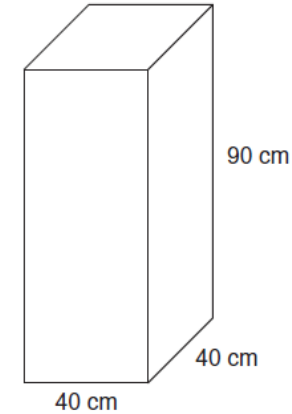
[1 mark]

- 7) I increase a number by 24%  
The answer is 6014.

What number did I start with?

[3 marks]

- 8) The diagram shows a water tank in the shape of a cuboid.



The tank is full of water.

1 litre = 1000 cm<sup>3</sup>

How many gallons of water are in the tank?

[4 marks]

- 9) The weights, in grams, of 15 turnips were as follows.

115	455	550	590	585	230	450	480
370	110	445	370	575	425	550	

For these 15 weights:

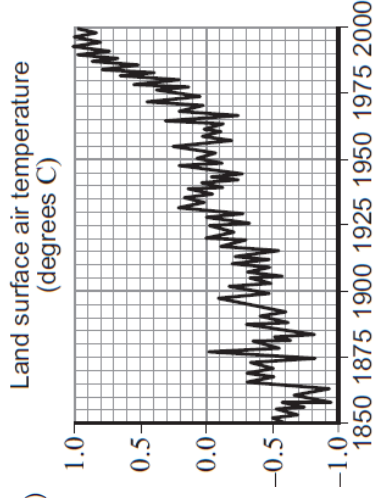
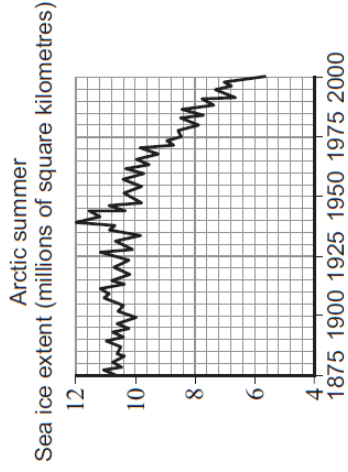
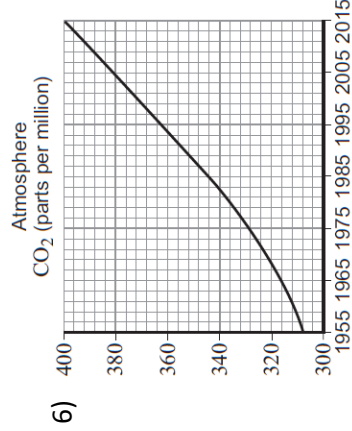
- (a) find the range, and state why the mode is **not** a suitable numerical measure;  
[2 marks]
- (b) find the median and calculate the interquartile range;  
[3 marks]
- (c) calculate the mean and the standard deviation.  
[2 marks]

- 10) a) Estimate how many people could fit into a lift. (you do not need to take into account weight)  
b) Is this realistic?  
c) How would changing one of your assumptions affect your answer

1) Negative correlation

Positive correlation

No correlation



Positive

Negative

None

Cannot tell