

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](#):



- 1) The shape of a water spout in a fountain can be modelled by the equation

$$y = 0.6x(3.6 - x)$$

where x metres and y metres are the horizontal and vertical displacements from the starting point of the water spout.

- (i) Complete the table of values on the answer sheet (2 marks)
- (ii) On the answer sheet draw the graph of $y = 0.6x(3.6 - x)$ for $0 \leq x \leq 4$. (2 marks)
- (iii) Use your graph to find x when $y = -0.5$. (1 mark)

- 2) The personnel department at a company wants to find out the views of staff on certain issues. It decides to carry out a survey on a sample of staff.

- (a) Give **one** advantage of doing the survey on a sample of staff rather than doing a census. [1 mark]
- (b) Write down a possible sample frame that the personnel department could use when picking the sample. [1 mark]
- (c) The personnel department decides to choose a sample of 160 staff, stratified by job title and gender.

Work out the number of male managers that it should choose.

[3 marks]

- 3) (a) The delivery charges, £ C , made by 'Fast Couriers' up to a distance of 50 miles are shown by the graph on the answer sheet

A formula for such a delivery charge is $C = ad^2 + F$, where a and F are constants.

- (a) (i) What is the fixed cost used by Fast Couriers? [1 mark]
- (a) (ii) Use the graph to find the delivery charge when the distance travelled is 30 miles. [1 mark]
- (a) (iii) P is the point on the graph where $d = 40$ and $C = 21$. Use the point P together with your answer to part (a)(i) to find the value of a . [3 marks]

- (b) Another courier service, 'Expert Couriers', calculates charges using the formula

$$C = \frac{1}{3}d + 6$$

where C is the cost, in £, and d is the distance travelled in miles.

- (b) (i) On the answer sheet, which shows Fast Couriers' costs, draw an accurate graph of

$$C = \frac{1}{3}d + 6 \quad \text{for values of } d \text{ from } 0 \text{ to } 60.$$

[4 marks]

- (b) (ii) Use the two graphs to find the value of d for which Expert Couriers' charges are the same as Fast Couriers' charges. [1 mark]

- 4) The table shows how much the BBC spent on its television channels in 2012.

	A	B
1	Channel	Amount spent (£ millions)
2	BBC 1	1337.6
3	BBC 2	537.1
4	BBC 3	112.9
5	BBC 4	67.8
6	BBC News	57.5
7	CBBC	107.4
8	CBeebies	42.4
9	Other	72.3
10	Total	

Which formula would give the value in cell **B10**?

[1 mark]

- 5) The first UK pop chart was in November 1952
The first year that there was a pop chart every week was 1953
In 1953 there were 15 different number 1 singles.
The table gives the number of weeks each of these singles was number 1 in the pop chart in 1953

Single	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Number of weeks at number 1	1	1	1	5	4	1	1	18	1	1	6	2	2	2	6

- (a) Which word describes this type of data?
Circle your answer. [1 mark]

Continuous Discrete Qualitative Grouped

- (b) One average is to be chosen to represent the data.
(b) (i) Why is the **mean** not the best average to use for this data?
Give **one** reason. [1 mark]

- (b) (ii) Why is the **mode** not the best average to use for this data?
Give **one** reason. [1 mark]

- (c) What percentage of these singles were at the number 1 position for exactly 2 weeks in 1953? [2 marks]

- (d) A number 1 single from 1953 is chosen at random.
What is the probability that it was at the number 1 position for **less** than 3 weeks?
Give your answer as a fraction in its simplest form. [2 marks]

- 6) (a) If you invested £2000 in the **Sainsbury's Internet Saver** account, with an AER of 3.50%, how much would be in this account after 3 years, assuming that the interest rate remained constant throughout the period? (2 marks)
- (b) Find the nominal interest rate for the **ING Savings** account. (4 marks)

Provider	Interest rate (AER)	Access	Interest	Minimum balance (£)
Alliance & Leicester eSaver Issue 2	6.30%	Instant	Monthly	1
Abbey eSaver Direct	6.00%	Instant	Annually	1
ING Savings account	6.00%	Instant	Monthly	1

- 7) Between January and March 2010, 4.4 million holidaymakers visited the eight most popular European holiday destinations.

Of the 4.4 million holidaymakers, 35% visited Spain.

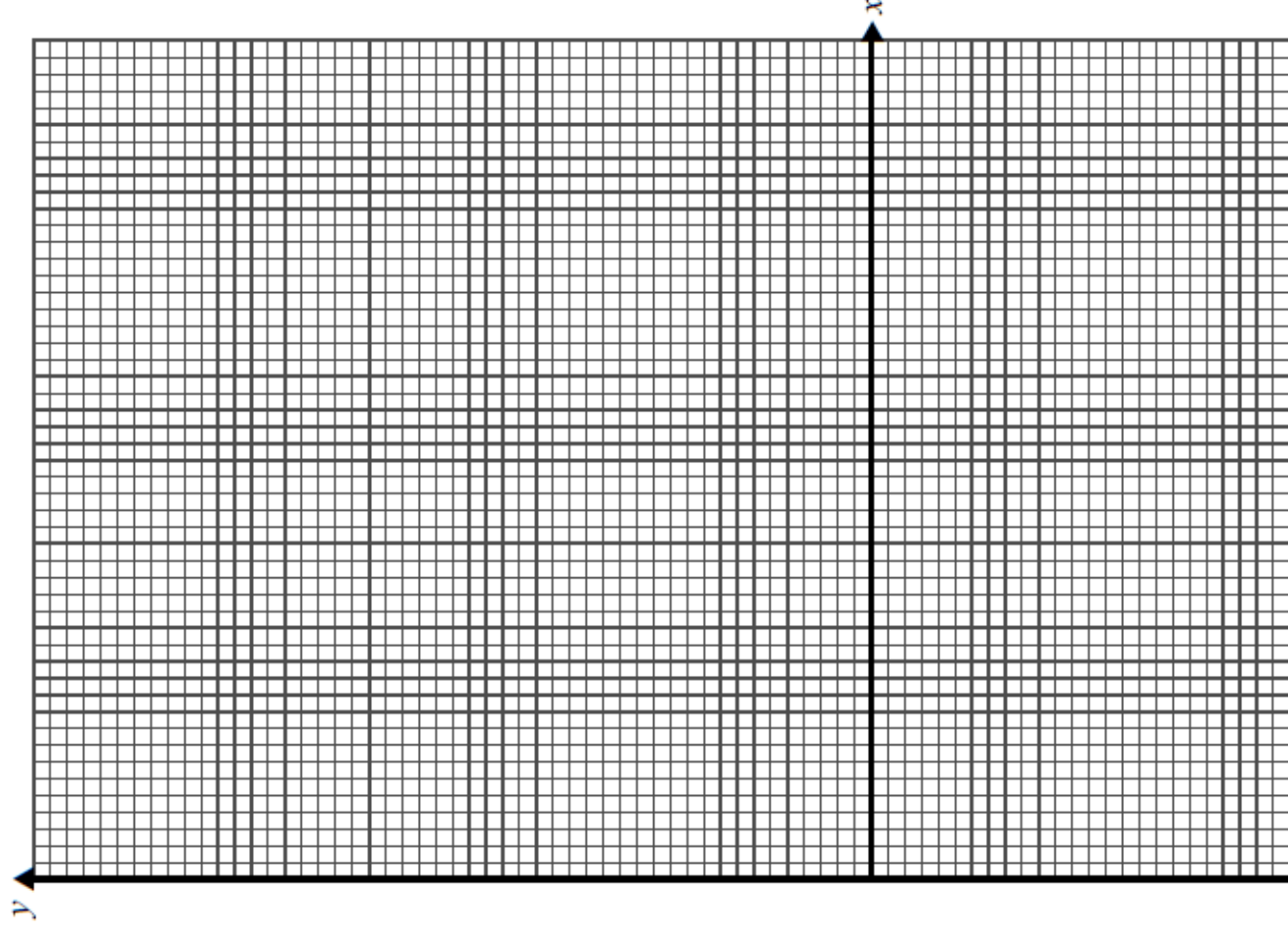
- (a) How many holidaymakers visited Spain?
- (b) The table below shows, correct to the nearest thousand, the number of holidaymakers who visited each of the eight most popular European holiday destinations between July and September 2010.

Destination	Number of holidaymakers
Spain	3 973 000
France	2 845 000
Greece	984 000
Italy	895 000
Germany	717 000
Netherlands	443 000
Belgium	273 000
Austria	167 000
Total	10 297 000

- (b) (i) What percentage of the 10 297 000 holidaymakers visited the Netherlands, Belgium or Austria?

1)

x	0	0.5	1	1.5	2	2.5	3	3.5	4
y	0	0.93	1.56						



3)

