

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 television series 'Educating Essex' showed the reality of working with teenagers.

Following a change in the number of applications from 2011 to 2012, the head teacher and deputy head teacher from the series were asked to become 'teaching ambassadors' and to help to recruit the best graduates to the profession.

The table below shows the number of applications for each type of teacher training in 2011 and 2012.

(a) Complete the spreadsheet above to show:

(a) (i) the decrease in the number of applications for each type of training;

[1 mark]

(a) (ii) the percentage decrease for each type of training.

Give these percentages to two decimal places.

[4 marks]

(b) State a formula which gives the value in cell E4.

[1 mark]

2) In the tax year 2012–2013, a person's personal tax-free allowance was £8105.

In the tax year 2013–2014, the personal tax-free allowance was increased to £9205.

To ensure that a person who paid tax at the higher rate (of 40%) did not benefit significantly from this change, the threshold on taxable income at which the 40% rate started was reduced from £34 370 to £32 245.

As a result of these two changes, find the annual reduction in income tax paid by someone who has an income of £50 000 in both tax years.

[7 marks]

3)

The table shows index numbers for the costs of some items in June 2014 using June 2007 as the base month.

Item	Index Number
Milk	130
Bread	134
Butter	157
Jam	143
Fruit	134

(a) Which item went up by over 50% from June 2007 to June 2014?

[1 mark]

Answer _____

(b) Sandra claims that all of the items in the table have increased in cost from June 2007 to June 2014

Is Sandra correct?

Give a reason for your answer.

[1 mark]

(c) On average, a pint of milk cost 40p in June 2007

Use the table to calculate the average cost of a pint of milk in June 2014

[2 marks]

4)

How many times, on average, does the human heart beat in a year?

Give your answer in standard form.

[3 marks]

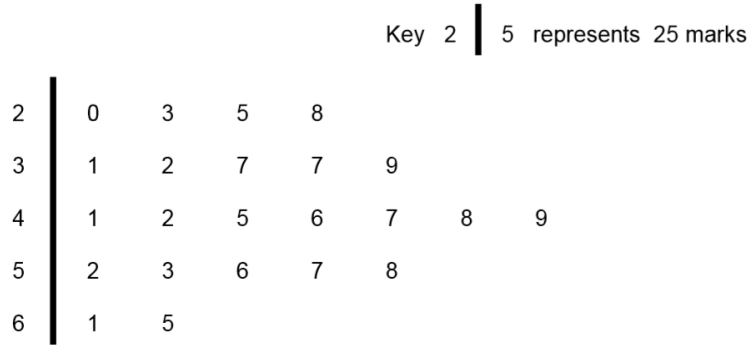
Assume that, on average, the human heart beats 3 billion times in a person's lifetime. (1 billion = 1 000 000 000)

Estimate the length of a person's lifetime.

Give your answer to the nearest year.

[3 marks]

5) The stem and leaf diagram shows the results of a test for the 23 students in class 11A.



The pass mark for this test was 38 marks.

(a) How many students in class 11A passed the test?

[1 mark]

Answer _____

(b) Work out the median mark.

[2 marks]

(c) Work out the lower and upper quartiles.

[3 marks]

The box and whisker plot shows the results of the same test for the students in class 11B.

(d) On the grid draw a box and whisker plot to show the results for class 11A.

[3 marks]

(e) Use the box and whisker plots to compare the results of the two classes.

[2 marks]

6) The table shows the results of 2890 students who sat a Functional Mathematics exam in May 2013. The maximum mark for the exam was 60.

Mark, m	Number of students
$0 \leq m \leq 10$	206
$10 < m \leq 20$	463
$20 < m \leq 30$	645
$30 < m \leq 35$	379
$35 < m \leq 40$	370
$40 < m \leq 50$	603
$50 < m \leq 60$	224

(a) Draw a histogram on the axes below to show the data.

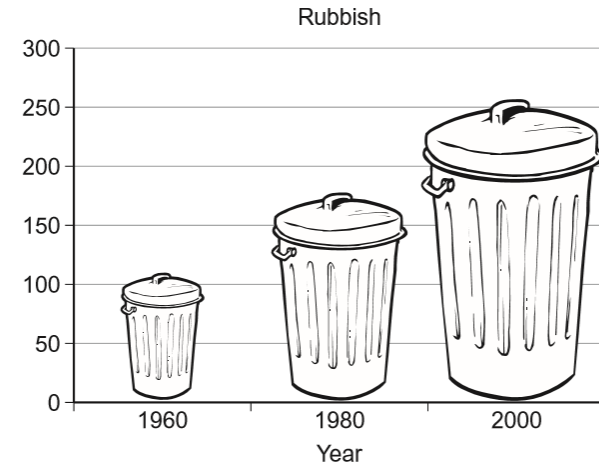
[5 marks]

(b) The pass mark for the exam was 34.

One of the 2890 students is chosen at random. Use the data to estimate the probability that the student passed the exam.

[3 marks]

7) The graph was used to show how much more rubbish has been produced since 1960.



Give two different criticisms of the graph.

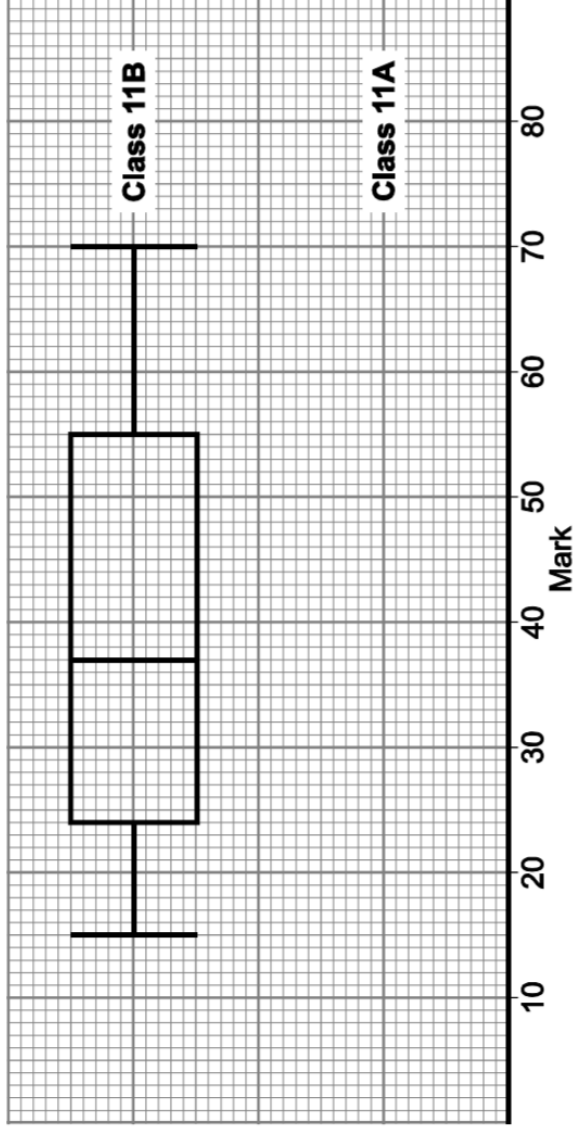
[2 marks]

1)

	A	B	C	D	E
1	Type of training	2011	2012	Decrease in number of applications	Percentage decrease
2	Secondary	22 585	19 019		
3	Middle	260	134		
4	Primary	25 337	21 862		

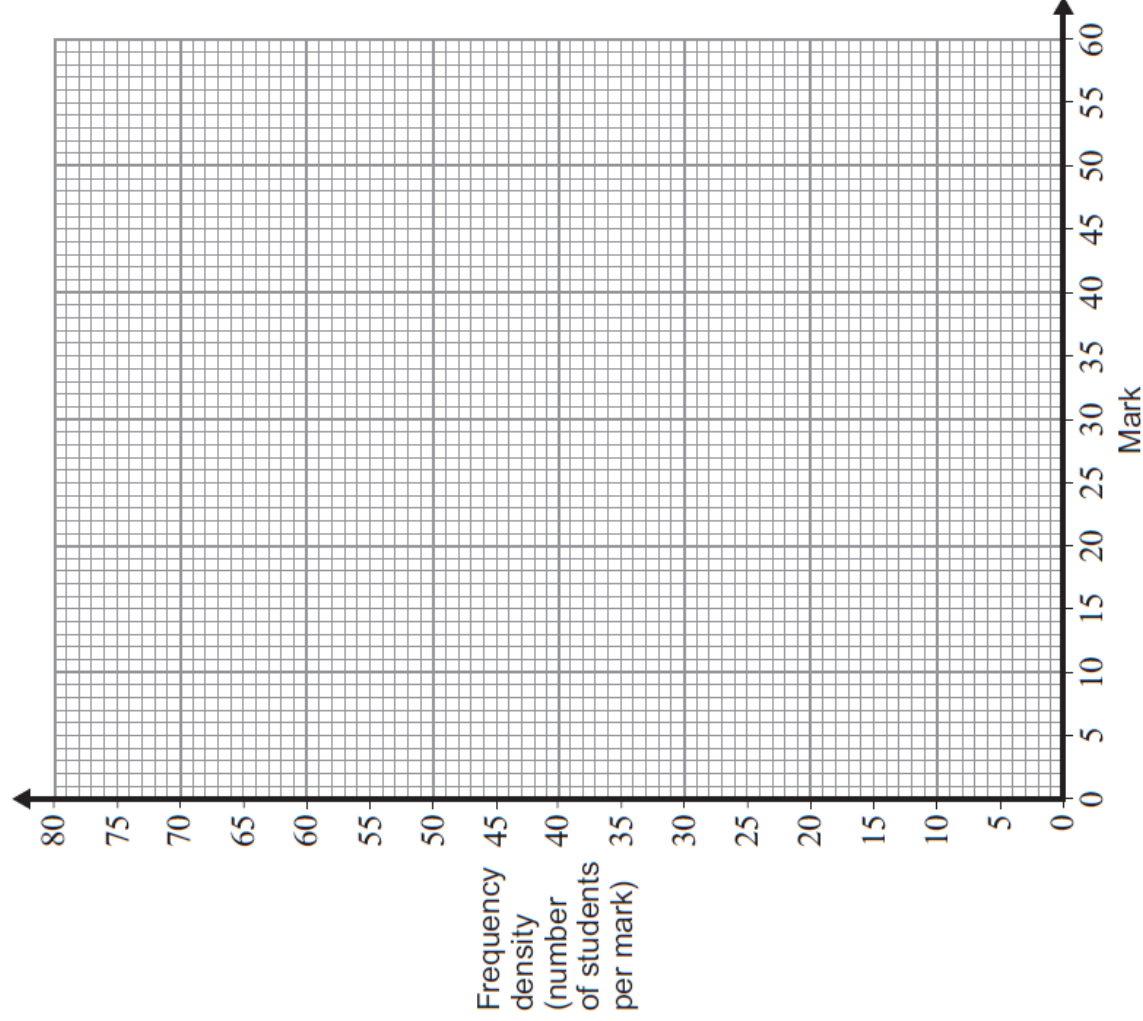
5)

The box and whisker plot shows the results of the same test for the students in class 11B.



6) Draw a histogram on the axes below to show the data.

[5 marks]



7)