1. The table gives information about the number of people staying in a hotel each quarter in 2011 and in 2012.

Year	2011				2012			
Quarter	1	2	3	4	1	2	3	4
Number of people	261	353	372	290	193	309	292	202

(*a*) Calculate the 4-point moving averages for this information.

The first three have been done for you.

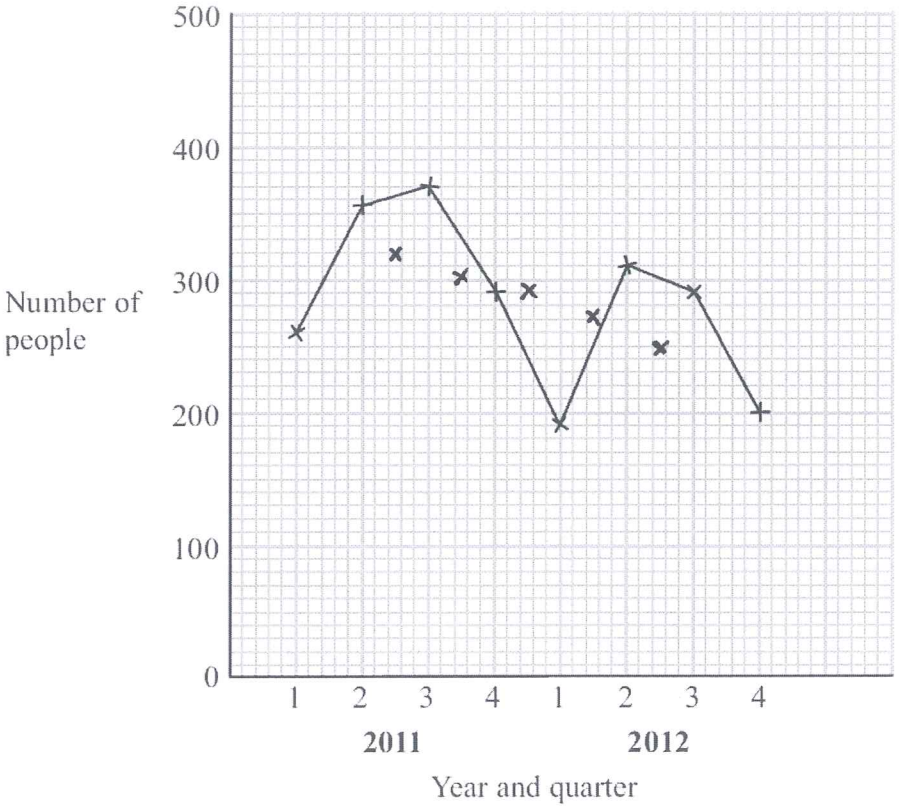
$\frac{290+193+309+292}{4}$ $\frac{193+309+292+202}{4}$

319, 302, 291, 271 , 249

(2)

The information in the table is shown on the grid.

(*b*) On the grid, plot the 4-point moving averages.



(2)

(*c*) Describe what the moving averages show about the trend in the number of people staying at the hotel over this period.

it is decreasing

(1)

(Total for Question 1 is 5 marks)

2. The table shows information about the numbers of shoes sold in a shop.

Year	Quarter	Number of Shoes
2010	1	255
	2	309
	3	285
	4	243
2011	1	294
	2	330

(*a*) Calculate the 4-point moving averages for this information.

$\frac{255+309+285+243}{4}$ $\frac{309+285+243+294}{4}$ $\frac{285+243+294+330}{4}$

273 282.75 288

(2)

(*b*) Describe what the moving averages show about the trend in the numbers of shoes sold in the shop over this period of time.

They are increasing

(1)

(Total for Question 2 is 3 marks)

3. The table shows information about the number of games consoles sold each month by a shop.

The table also shows 3-point moving averages for this information.

Month	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Number of games consoles	64	84	53	91	108	92	154
3-point moving average		67	76	84	97	x	

(*a*) Using the information given in the table, work out the last 3-point moving average, x.

$$\frac{108 + 92 + 154}{3}$$

118

(2)

(*b*) Describe what the moving averages show about the trend in the number of games consoles sold in the shop over these months.

(They number of games sold is) increasing

(1)

(Total for Question 3 is 3 marks)

4. The table shows the number of laptops sold in each of the first five months of 2012.

Month	January	February	March	April	May
Number of laptops	2190	2220	2280	2250	2280

(*a*) Work out the 3-point moving averages for the first five months of 2012.

$\frac{2190+2220+2280}{3}$ $\frac{2220+2280+2250}{3}$ $\frac{2280+2250+2280}{3}$

2230 2250 2270

(2)

The 3-point moving average of the number of laptops sold in April, May and June of 2012 was 2300.

(*b*) Work out the number of laptops sold in June 2012.

$\frac{2250+2280+x}{3} = 2300$

$2250+2280+x = 6900$

$x = 2370$

2370

(2)

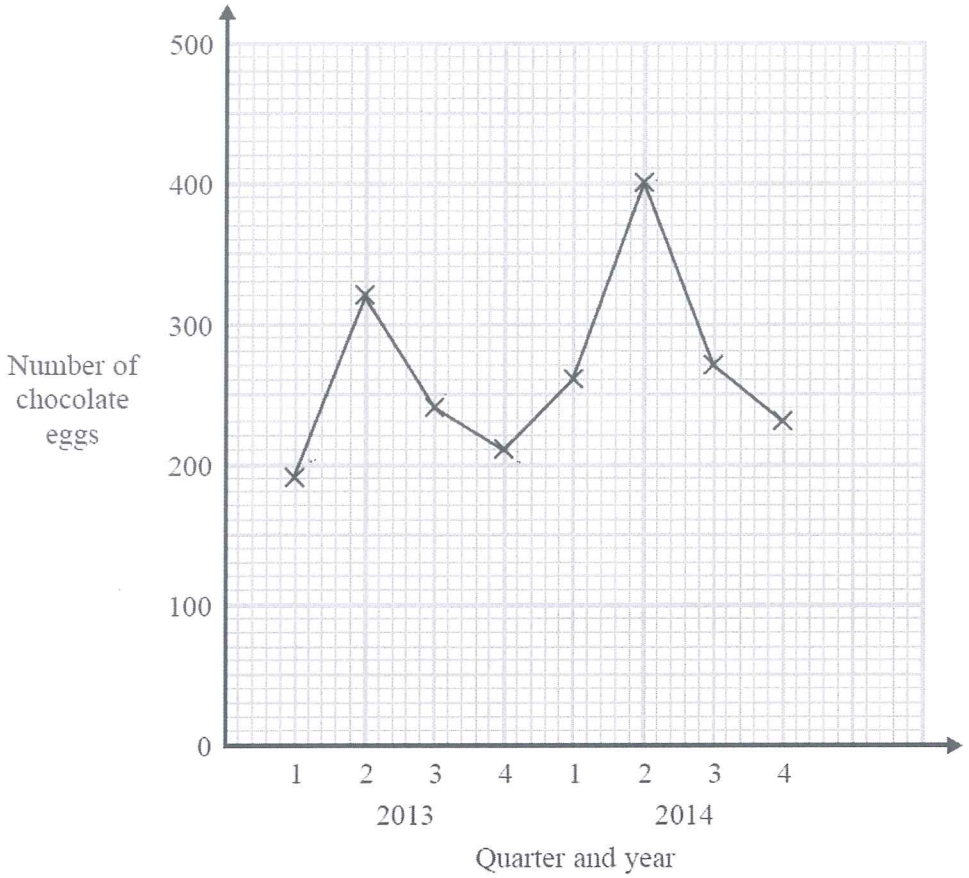
(*c*) Describe what the moving averages show about the trend in the number of laptops sold in the shop in the first six months of 2012.

(The number of laptops sold is) increasing

(1)

(Total for Question 4 is 5 marks)

5 The time-series graph gives information about the number of chocolate eggs sold in a shop each quarter in 2013 and in 2014.



(*a*) Calculate the 4-point moving averages for the information in the graph.

You must show your working.
The first three have been done for you.

$\frac{210 + 260 + 400 + 270}{4}$ $\frac{260 + 400 + 270 + 230}{4}$

240, 257.5, 277.5, 285 , 290

(3)

(*b*) Describe what the moving averages show about the trend in the number of chocolate eggs sold in the shop during this period.

(The number of chocolates sold is) increasing

(1)

(Total for Question 5 is 4 marks)

6. The table gives information about the number of students who enrol for a course in each term in 2011, in 2012 and in 2013.
The 3-point moving averages are given correct to 3 significant figures.

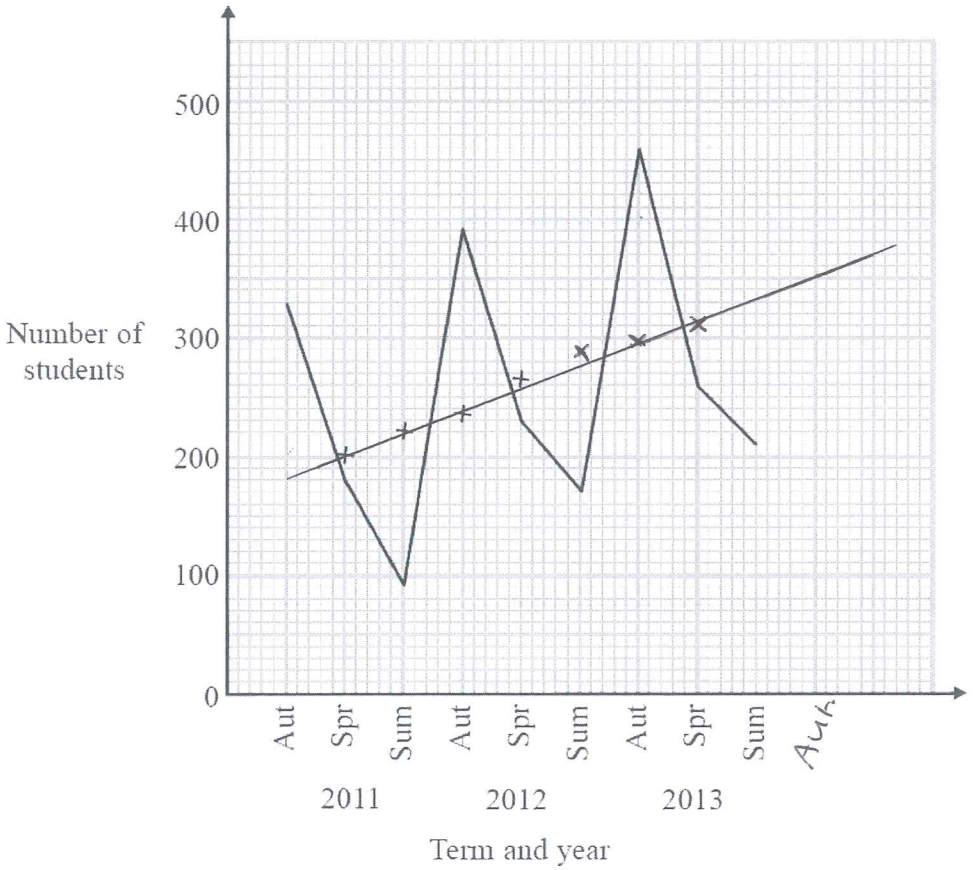
Year	Term	Number of students	3-point moving average
2011	Autumn	330	
	Spring	180	200
	Summer	90	220
2012	Autumn	390	237
	Spring	230	263
	Summer	170	287
2013	Autumn	460	297
	Spring	260	x
	Summer	210	

(*a*) Calculate the value of x in the table.
Give your answer correct to 3 significant figures.

$\frac{460+260+210}{3}$ 310

(2)

(*b*) Plot the 3-point moving averages on the time-series graph.
The first four have been done for you.



(2)

(*c*) On the time-series graph, draw a trend line for the 3-point moving averages.

(1)

(*d*) (i) Use your trend line to find an estimate for the mean seasonal variation in numbers enrolling for the Autumn Term.

$$\frac{150 + 150 + 150}{3}$$

150

(2)

(ii) Predict the number of students who will enrol in the Autumn Term of 2014.

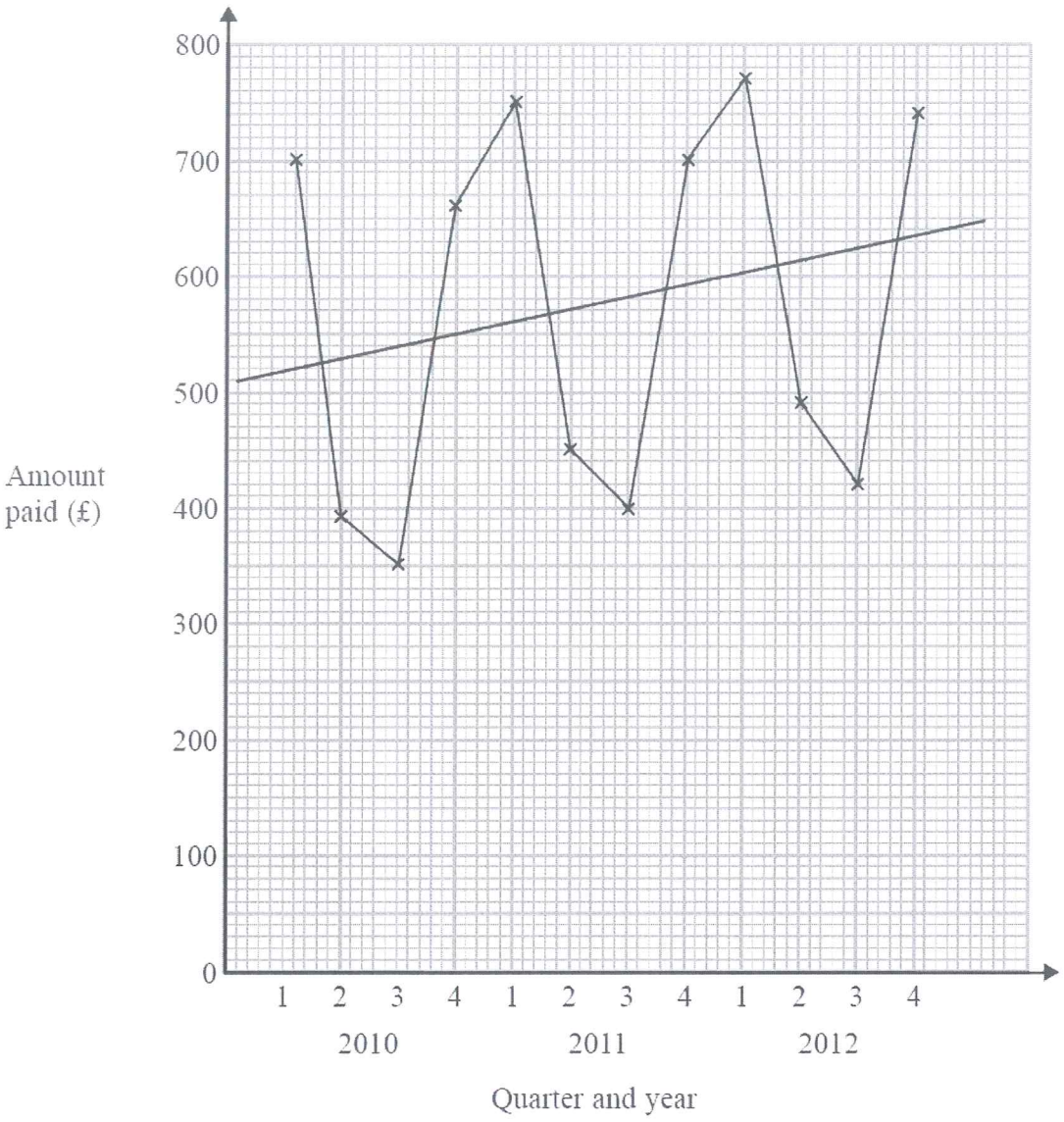
350 + 150

500

(2)

(Total for Question 6 is 9 marks)

7. This time-series graph gives information about the quarterly electricity bills paid by a household from 2010 to 2012.



A trend line has been drawn on the graph.

(*a*) Describe the trend.

Increasing

(1)

(*b*) Work out the seasonal variation for quarter 2 of 2012.

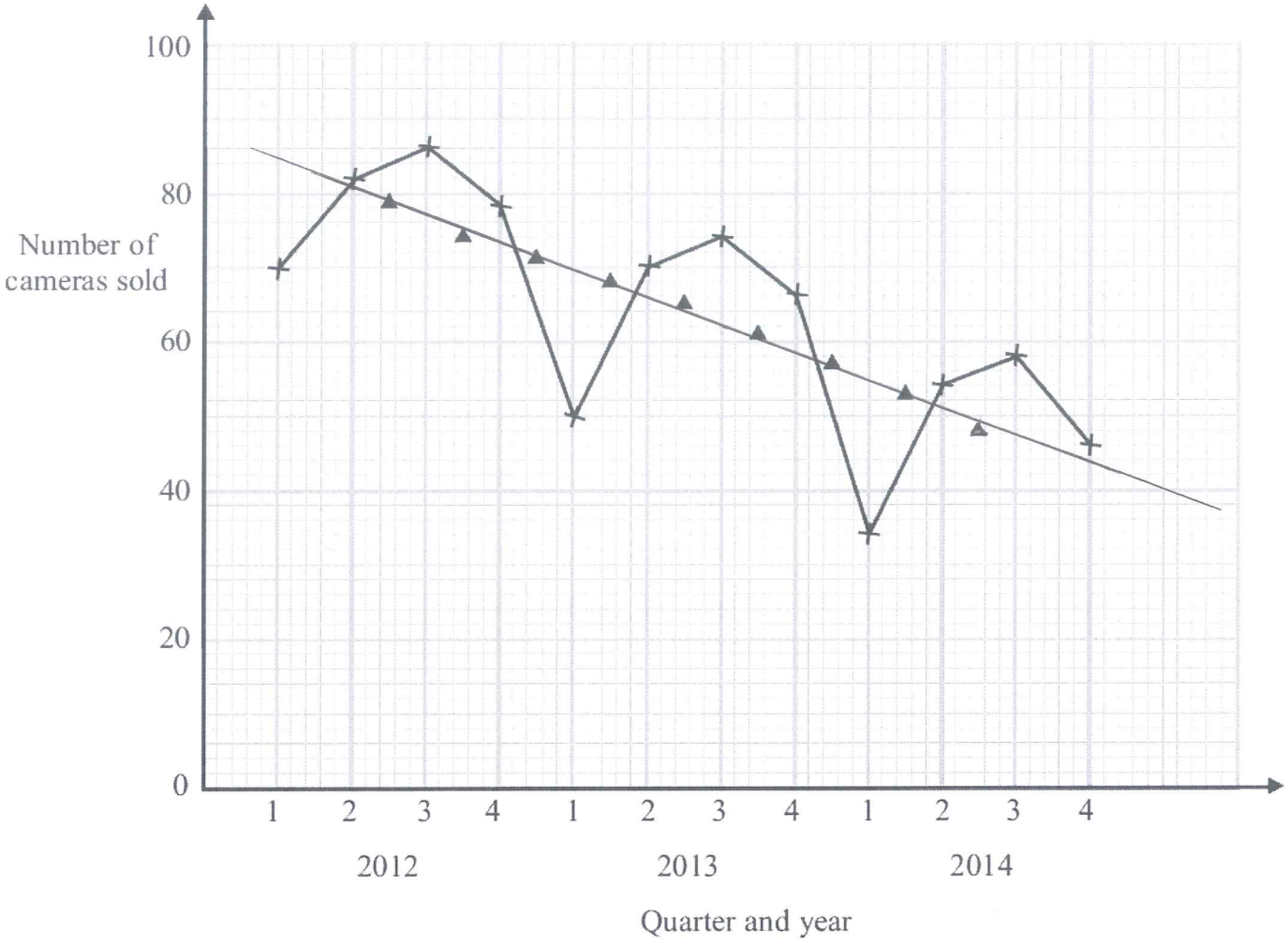
490 − 610

−120

(2)

(Total for Question 7 is 3 marks)

8. The time-series graph shows information about the number of cameras sold by a shop each quarter from 2012 to 2014.



Key: ▲ 4-point moving average

The graph also shows the first eight 4-point moving averages for this information.

(*a*) Work out the last 4-point moving average for this information and plot it on the grid.

$$\frac{34 + 54 + 58 + 46}{4} = 48$$

(3)

(*b*) Describe the trend shown by the moving averages.

decreasing

(1)

(*c*) (i) Find an estimate for the mean seasonal variation for quarter 1.

$$\frac{-14 + -20 + -20}{3} = -18$$

-18

(ii) Work out an estimate for the number of cameras sold in quarter 1 of 2015.

$40 - 18$

22

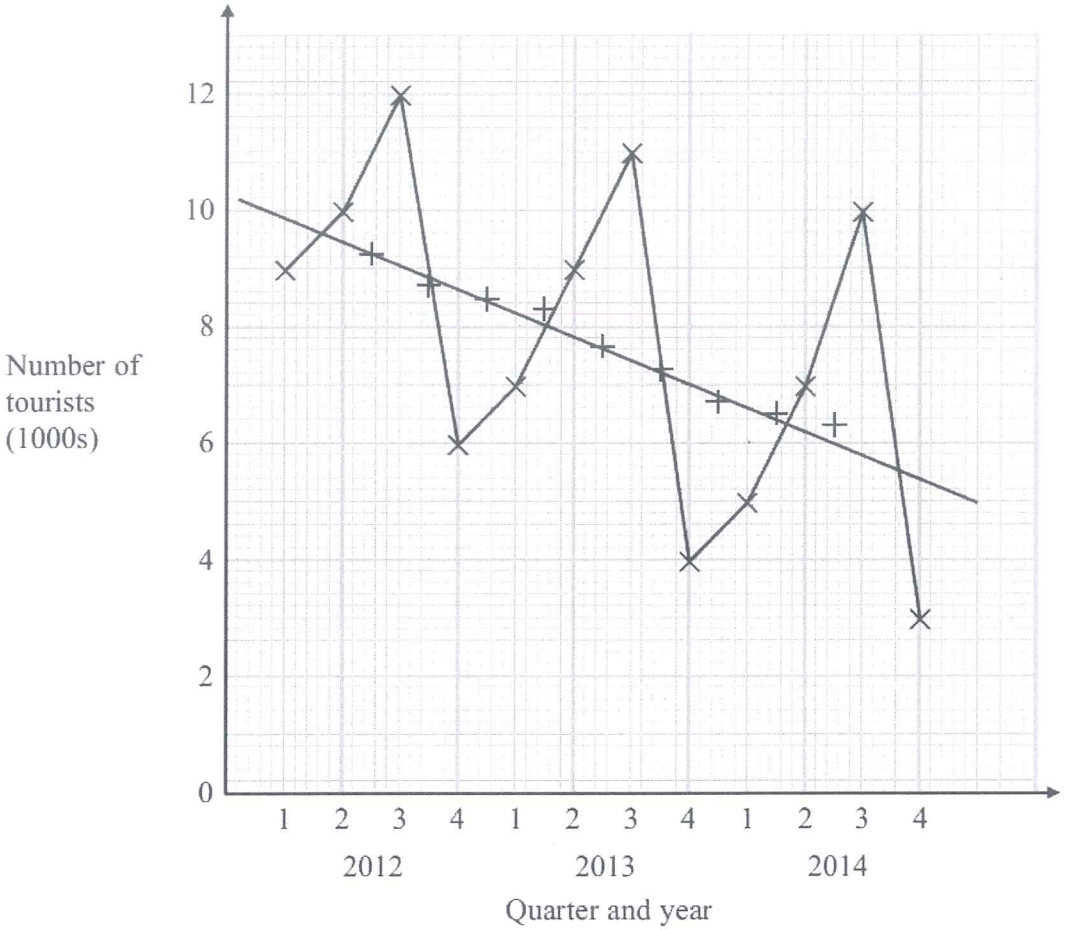
(4)

(Total for Question 8 is 8 marks)

9. The time–series graph shows information about the number of tourists who visited a museum each quarter for the years 2012, 2013 and 2014.

The graph also shows the 4-point moving averages for this information.

A trend line for the moving averages has been drawn.



(*a*) Describe the trend.

decreasing

(1)

(*b*) Calculate the mean seasonal variation for quarter 1.

$$\frac{-0.8 + -1.2 + -1.6}{3}$$

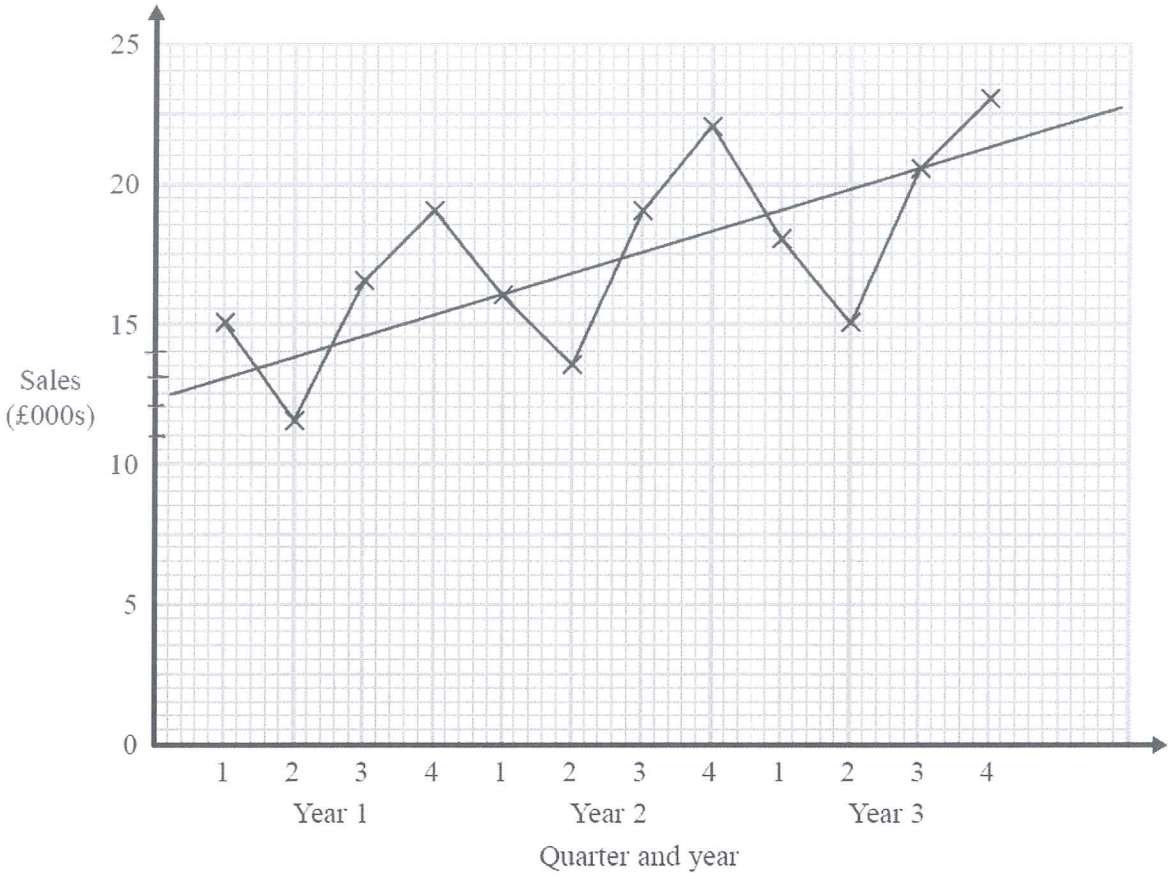
-1.2

(-1200)

(2)

(Total for Question 9 is 3 marks)

10 The time-series graph gives information about the quarterly sales, in thousands of pounds, from a factory over a three year period.



A trend line has been drawn on the graph.

(*a*) Describe the trend.

increasing

(1)

(*b*) Calculate an estimate for the mean seasonal variation for quarter 1.

$$\frac{2 + 0 + -1}{3} = 0.\dot{3}$$

$0.\dot{3} \times 1000 = £333.33$

£ 333.33

(3)

(Total for Question 10 is 4 marks)