A Level Statistics

AQA Past Exam Questions

TOPIC: Data Representation and Interpretation

Candidates may use any calculator allowed by Pearson regulations. Calculators must not have retrievable mathematical formulae stored in them.

Instructions

• Use **black** ink or ball-point pen.

• If pencil is used for diagrams/sketches/graphs it must be dark (HB or B). Coloured pencils and highlighter pens must not be used.

• **Fill in the boxes** at the top of this page with your name, centre number and candidate number.

• Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.

• Answer the questions ***on paper***

• You should show sufficient working to make your methods clear. Answers without working may not gain full credit.

• Unless otherwise stated, statistical tests should be carried out at the 5% significance level.

• When a calculator is used, the answer should be given to three significant figures unless otherwise stated.

Information

• ***You may use the*** booklet 'Statistical Formulae and Tables'

• There are **8** questions in this question paper. The total mark for this paper is ***127***

• The marks for **each** question are shown in brackets – use this as a guide as to how much time to spend on each question.

Advice

• Read each question carefully before you start to answer it.

• Try to answer every question.

• Check your answers if you have time at the end.

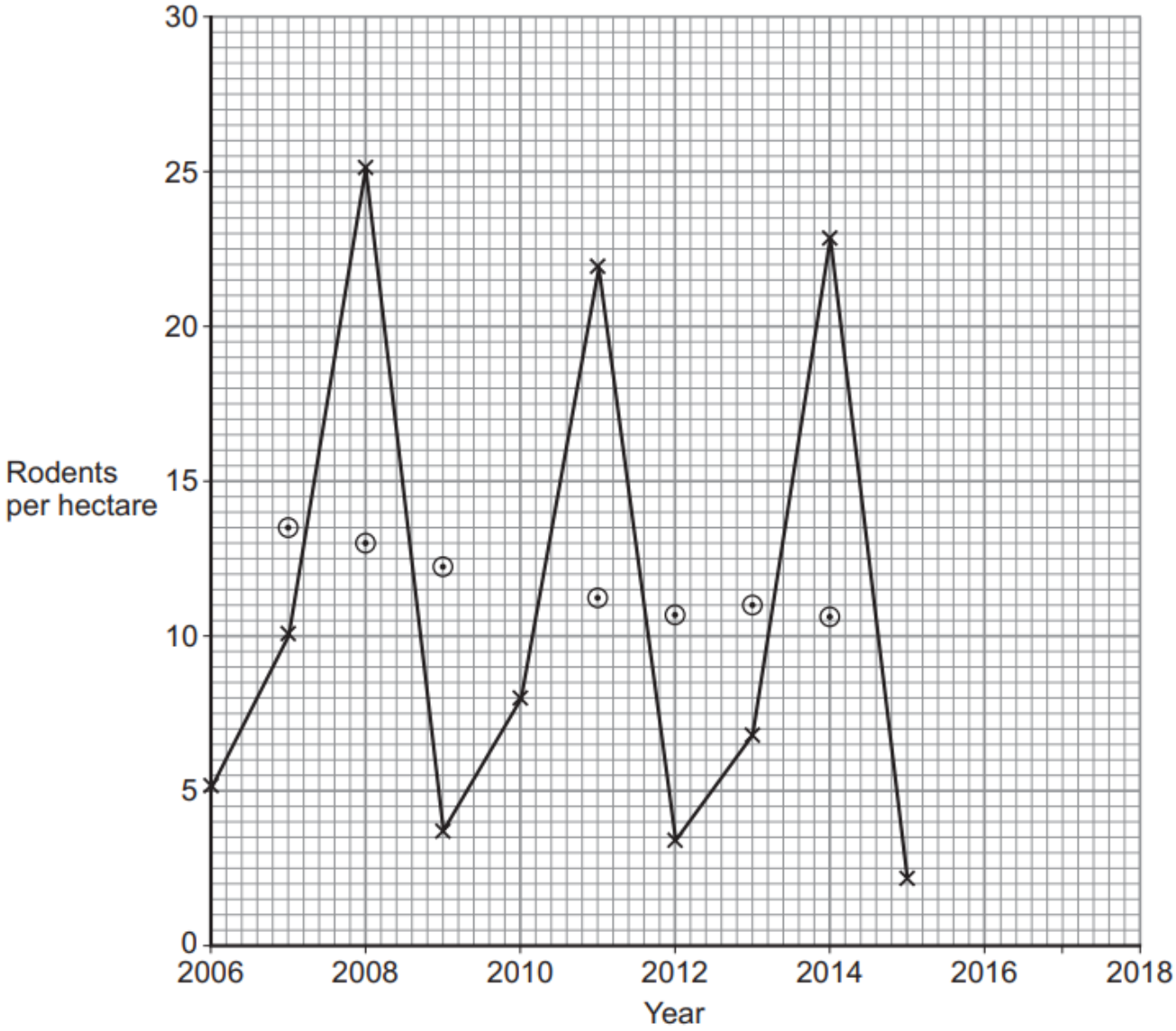
• If you change your mind about an answer, cross it out and put your new answer and any working underneath.

• Check your answers if you have time at the end.

AQA_JUNE_2018_2

A scientist has been monitoring the population of small rodents on an island every April for many years. The population shows a cyclical pattern.

Figure 1



(a) Estimate the number of rodents per hectare expected for 2017, showing how you have obtained your estimate.

[4 marks]

(b) The population measured by the scientist for 2016 was 5.1 rodents per hectare, and for 2017 the population measured was 9.2 rodents per hectare. Make one comment about each of these values.

[2 marks]

AQA_June_2017_1

The table shows, for 2012, the country and regional breakdown of expenditure on research and development (R&D) in the UK by sector performing the R&D. The figures are in millions of pounds.

	Sector performing the R&D				
	Government	Higher Education	Business	Private Non-Profit	**Total**
North East	0	237	282	23	**542**
North West	75	581	1 784	4	**2 444**
Yorkshire & Humber	58	503	603	1	**1 165**
East Midlands	85	347	1 203	4	**1 639**
West Midlands	2	353	1 461	4	**1 820**
East of England	207	650	3 449	225	**4 531**
London	323	1 767	1 477	121	**3 688**
South East	793	1 033	4 086	111	**6 023**
South West	345	363	1 364	11	**2 083**
Total England	**1 889**	**5 834**	**15 708**	**504**	**23 935**
Wales	31	264	272	2	**569**
Scotland	233	973		9	**1 922**
Northern Ireland	21	141	420	0	**582**
Total UK	**2 173**	**7 211**	**17 107**	**515**	**27 006**

(a) State the expenditure on R&D in 2012 by Private Non-Profit organisations in the East of England.

[1 mark]

(b) The figure in the table representing expenditure on R&D by Business in Scotland in 2012 has been omitted. Calculate the omitted figure.

[2 marks]

(c) What percentage of the expenditure on R&D in the West Midlands in 2012 was by Higher Education?

[2 marks]

(d) A statistician draws a pie chart to illustrate how the total expenditure on R&D was divided between the four countries of the UK in 2012. Calculate the angle which should be used for England in this pie chart.

[2 marks]

AQA_June_2016_1

The heights of a sample of 240 female students and 240 male students were measured. The data for the female students are summarised as a box plot in Figure 1.

The data for the male students are summarised as a cumulative frequency graph in Figure 2. Using the information in the two figures, compare the distribution of heights for the female students with that for the male students. You should make reference to the difference, if any, between:

(a) the average values of height;

(b) the values of a measure of spread;

(c) the symmetry, or otherwise, of the two distributions.

[6 marks]

Figure 1

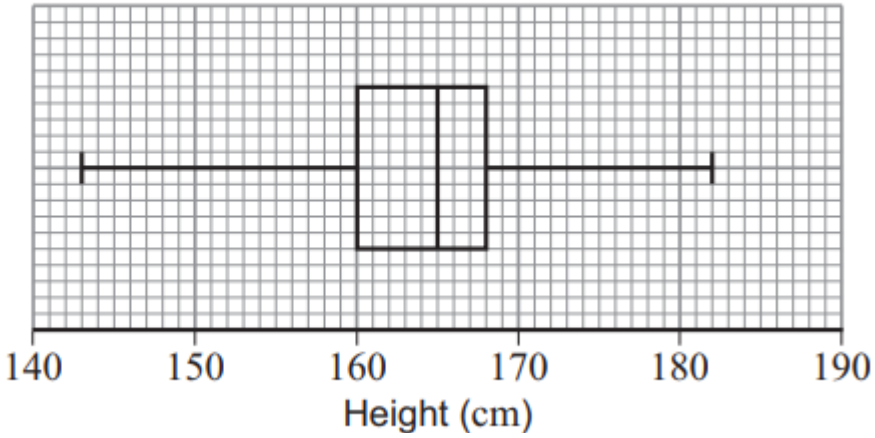
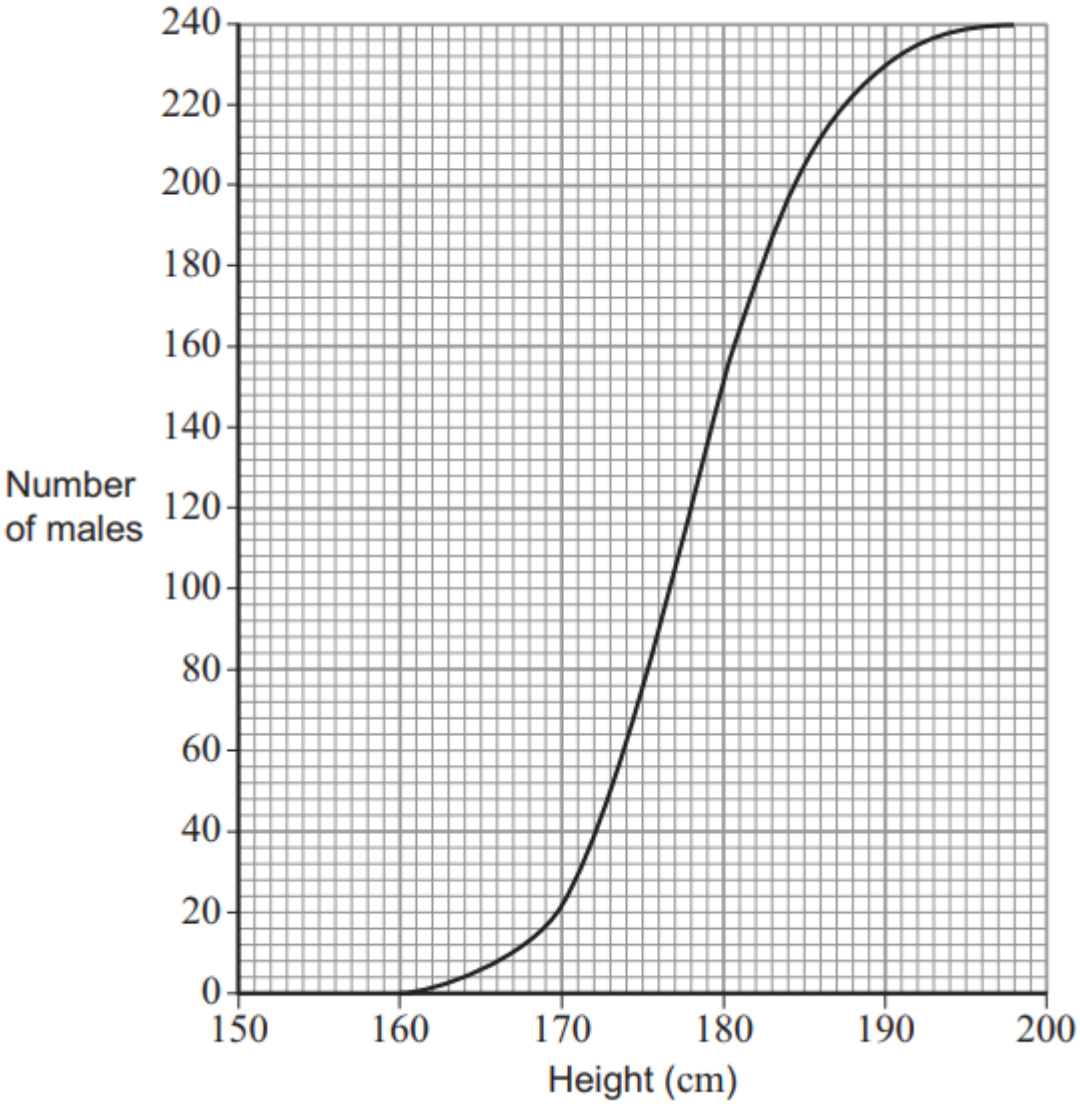


Figure 2



AQA_June_2016_3

The table below shows, by mode of travel for the period 1980 to 2013, the numbers of visits abroad by UK residents and the amounts that they spent.

(a) The total number of visits tabulated for 1983 is less than the sum of the tabulated number of visits by air and by sea in 1983. Give a reason why this has happened.

[1 mark]

(b) Calculate the average amount spent per visit by UK residents travelling abroad by sea in 1999. Give your answer to the nearest pound (£).

[2 marks]

(c) Calculate the percentage reduction in total spending by UK residents travelling abroad in 2009, compared with that in 2008.

[2 marks]

(d) Kayla wants to draw two comparative pie charts for 1980 and 2013, to illustrate the numbers of visits and the modes of travel. She will use a circle with radius 5 cm for the 1980 chart.

i. Calculate the angle that Kayla should use for the sector representing air travel in 1980

[2 marks]

ii. Calculate the radius of the circle that Kayla should use for the 2013 pie chart.

[3 marks]

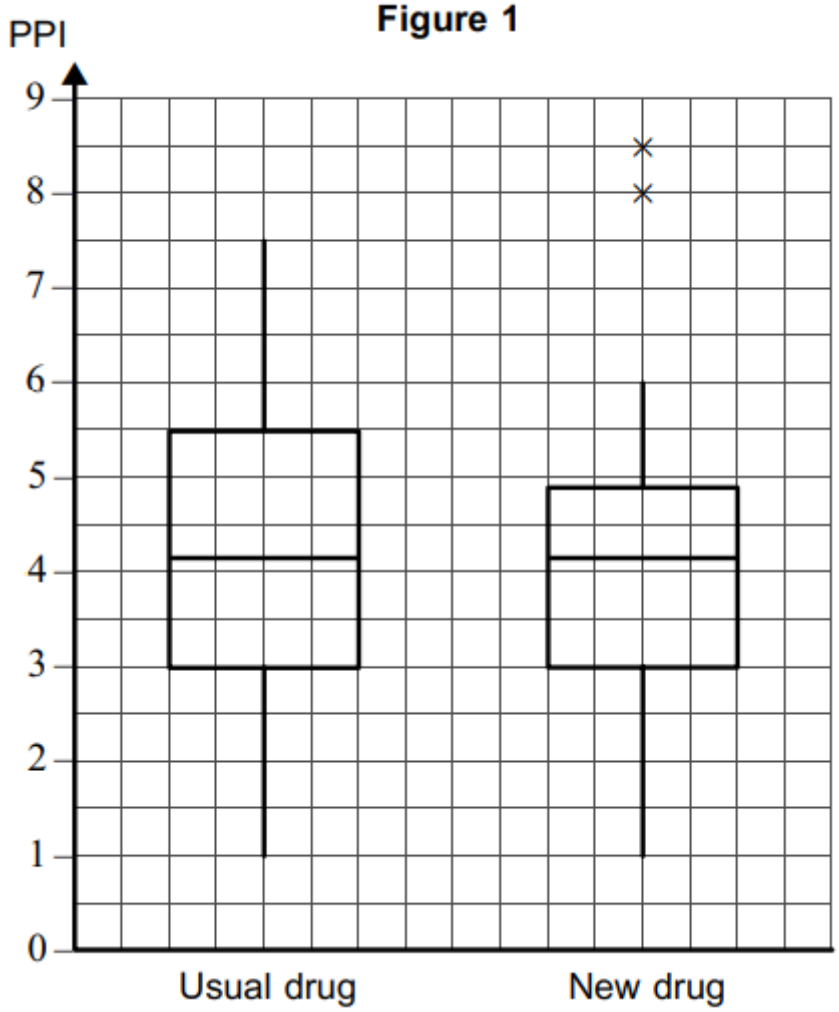
UK residents' visits and spending abroad: by mode of travel 1980 to 2013

	Air		Sea		Channel Tunnel		Total	
	Visits (thousands)	Spending (£ million)	Visits (thousands)	Spending (£ million)	Visits (thousands)	Spending (£ million)	Visits (thousands)	Spending (£ million)
1980	10 748	2 029	6 759	710			17 507	2 738
1981	11 374	2 361	7 672	911			19 046	3 272
1982	12 031	2 656	8 580	984			20 611	3 640
1983	12 361	2 959	8 634	1 131			20 994	4 090
1984	13 934	3 524	8 137	1 139			22 072	4 663
1985	13 732	3 695	7 878	1 176			21 610	4 871
1986	16 380	4 632	8 569	1 451			24 949	6 083
1987	19 369	5 739	8 077	1 541			27 447	7 280
1988	21 026	6 655	7 802	1 560			28 828	8 216
1989	21 925	7 457	9 105	1 900			31 030	9 357
1990	21 368	7 747	9 782	2 139			31 150	9 886
1991	20 408	7 740	10 401	2 211			30 808	9 951
1992	23 357	8 891	10 479	2 352			33 836	11 243
1993	25 354	10 316	11 366	2 656			36 720	12 972
1994	27 624	11 595	11 991	2 768	14	2	39 630	14 365
1995	28 097	12 250	11 311	2 718	1 937	419	41 345	15 386
1996	27 907	12 926	10 686	2 509	3 457	788	42 050	16 223
1997	30 341	13 402	11 522	2 791	4 095	739	45 957	16 931
1998	34 283	15 397	10 498	2 726	6 092	1 367	50 872	19 489
1999	37 510	17 623	10 427	2 958	5 944	1 439	53 881	22 020
2000	41 392	19 905	9 646	2 766	5 799	1 580	56 837	24 251
2001	43 011	20 934	9 651	2 844	5 619	1 554	58 281	25 332
2002	43 990	22 273	10 038	3 206	5 349	1 482	59 377	26 962
2003	47 101	23 846	9 200	3 096	5 123	1 607	61 424	28 550
2004	50 435	25 879	8 950	2 991	4 809	1 415	64 194	30 285
2005	53 626	27 994	8 102	2 750	4 713	1 410	66 441	32 154
2006	56 460	29 655	8 411	3 242	4 665	1 515	69 536	34 411
2007	56 329	30 507	8 473	2 937	4 649	1 570	69 450	35 013
2008	56 041	31 497	8 145	3 535	4 825	1 806	69 011	36 838
2009	46 657	27 044	7 559	3 105	4 398	1 545	58 614	31 694
2010	43 239	26 357	8 056	3 910	4 267	1 553	55 562	31 820
2011	44 723	26 555	7 857	3 610	4 255	1 537	56 836	31 701
2012	44 916	27 543	6 755	3 096	4 867	1 811	56 538	32 450
2013	46 543	29 480	7 166	3 621	4 798	1 798	58 507	34 900

AQA_June_2015_1

Researchers conducted a trial of a new drug intended to reduce pain after surgery. Immediately after their surgery, the patients in the trial received either the usual pain-reduction drug or the new drug. Later, 24 hours after the surgery, the patients recorded their Perceived Pain Index (PPI), where a higher score represents greater pain. The box plots in Figure 1 illustrate the data from the trial. The plot for the patients receiving the new drug includes two outliers.

Figure 1



(a) State the highest value of PPI recorded during the trial.

[1 mark]

(b) When comparing the data from the two groups of patients, one of the researchers made the following statement. “The lowest value of PPI is the same for both drugs, but only the new drug has outliers.” Make three further comments comparing the data from the two groups of patients as illustrated in Figure 1. Your answer should include at least one similarity and at least one difference.

[3 marks]

AQA_June_2015_2

Table 1, printed below, contains data about UK food and beverage service activities for the years 2008, 2009 and 2010.

Table 1

ANNUAL BUSINESS SURVEY – FOOD & BEVERAGE SERVICE ACTIVITIES

Description	Year	Number of enterprises	Total turnover	Total employment (average)	Total employment costs	Total net capital expenditure
		Number	£ million	Thousand	£ million	£ million
Restaurants and mobile food service activities	2008	63 368	22 452	753	6 255	1 021
	2009	61 192	22 658	653	6 460	1 104
	2010	61 387	23 004	687	6 302	996
Event catering activities	2008	6 649	7 000	247	2 788	83
	2009	6 070	6 139	220	2 782	33
	2010	5 767	7 008	254	2 957	117
Other food service activities	2008	887	539	13	162	5
	2009	979	672	12	170	11
	2010	1 264	682	18	192	18
Beverage serving activities	2008	49 875	20 150	567	4 726	868
	2009	45 714	19 491	575	4 876	667
	2010	44 351	19 574	543	4 542	375
Total food and beverage service activities	2008		50 141	1 578	13 930	1 978
	2009	113 955	48 960	1 460	14 288	1 815
	2010	112 769	50 268	1 502	13 993	1 506

(a) State the total employment costs for people employed in ‘Event catering activities’ during 2009.

[1 mark]

(b) The figure for the total number of enterprises for 2008 has been omitted. State the value of the missing figure.

[1 mark]

(c) Calculate the percentage reduction in total net capital expenditure for ‘Beverage serving activities’ between 2008 and 2010**.**

[2 marks]

(d) Calculate the mean employment cost per employee in ‘Event catering activities’ for 2010.

[2 marks]

AQA_June_2014_6

Table 3 contains data about the numbers of live births to mothers of different ages in England and Wales during the period 1961 to 2010.

Table 3

Live births by age of mother, 1961–2010 England and Wales Numbers

Year	*All ages*	Under 20	20–24	25–29	30–34	35–39	40 and over
2010	723 165	40 591	137 312	199 233	202 457	115 841	27 731
2009	706 248	43 243	136 012	194 129	191 600	114 288	26 976
2008	708 711	44 691	135 971	192 960	192 450	116 220	26 419
2007	690 013	44 805	130 784	182 570	191 124	115 380	25 350
2006	669 601	45 509	127 828	172 642	189 407	110 509	23 706
2005	645 835	44 830	122 145	164 348	188 153	104 113	22 246
2004	639 721	45 094	121 072	159 984	190 550	102 228	20 793
2003	621 469	44 236	116 622	156 931	187 214	97 386	19 080
2002	596 122	43 467	110 959	153 379	180 532	90 449	17 336
2001	594 634	44 189	108 844	159 926	178 920	86 495	16 260
2000	604 441	45 846	107 741	170 701	180 113	84 974	15 066
1999	621 872	48 375	110 722	181 931	185 311	81 281	14 252
1998	635 901	48 285	113 537	193 144	188 499	78 881	13 555
1997	643 095	46 372	118 589	202 792	187 528	74 900	12 914
1996	649 485	44 667	125 732	211 103	186 377	69 503	12 103
1995	648 138	41 938	130 744	217 418	181 202	65 517	11 319
1994	664 726	42 026	140 240	229 102	179 568	63 061	10 729
1993	673 467	45 121	151 975	235 961	171 061	58 824	10 525
1992	689 656	47 861	163 311	244 798	166 839	56 650	10 197
1991	699 217	52 396	173 356	248 727	161 259	53 644	9 835
1990	706 140	55 541	180 136	252 577	156 264	51 905	9 717
1989	687 725	55 543	185 239	242 822	145 320	49 465	9 336
1988	693 577	58 741	193 726	243 460	140 974	47 649	9 027
1987	681 511	57 545	193 232	238 929	136 558	46 604	8 643
1986	661 018	57 406	192 064	229 035	129 487	45 465	7 561
1985	656 417	56 929	193 958	227 486	126 185	44 393	7 466
1984	636 818	54 508	191 455	218 031	122 774	42 921	7 129
1983	629 134	54 059	191 852	214 078	120 996	41 277	6 872
1982	625 931	55 435	192 322	211 905	120 758	38 992	6 519
1981	634 492	56 570	194 500	215 760	126 590	34 210	6 860
1980	656 234	60 754	201 541	223 438	129 908	33 893	6 700
1979	638 028	59 143	193 209	222 102	125 664	31 394	6 516
1978	596 418	55 984	182 580	210 598	113 077	27 937	6 242
1977	569 259	54 477	174 544	207 916	100 807	25 527	5 988
1976	584 270	57 943	182 210	220 712	90 791	26 117	6 497
1975	603 445	63 507	190 198	225 990	88 379	28 147	7 224
1974	639 885	68 724	208 084	235 593	89 132	30 308	8 044
1973	675 953	73 270	223 675	243 753	91 800	34 178	9 277
1972	725 440	79 087	249 109	247 676	98 739	39 821	11 008
1971	783 155	82 641	285 703	247 239	109 616	45 224	12 732
1970	784 486	80 975	289 209	238 228	114 086	48 323	13 665
1969	797 538	81 659	289 012	238 381	120 395	52 843	15 248
1968	819 272	82 075	295 946	240 807	125 316	58 083	17 045
1967	832 164	84 542	291 656	243 802	130 279	63 085	18 800
1966	849 823	86 746	285 808	253 743	136 406	67 036	20 084
1965	862 725	81 611	278 874	263 395	144 638	72 022	22 185
1964	875 972	76 734	276 103	270 700	153 513	75 371	23 551
1963	854 055	71 640	267 559	263 241	153 696	74 401	23 518
1962	838 736	67 334	260 882	256 386	153 985	76 219	23 930
1961	811 281	59 786	249 829	248 540	152 286	77 516	23 324

Source: Office for National Statistics

(a) Demographers often refer to the ‘baby boom’ of the 1960s. In which year did the peak of this boom occur?

[1 mark]

(b) Describe the trend shown by the data for mothers aged ‘40 and over’ from 1961 to 2010.

[2 marks]

(c) Find the percentage reduction in the number of live births to mothers aged ‘Under 20’ from the 1966 figure to the 2010 figure**.**

[3 marks]

AQA_June_2013_4

The numbers of customers at Carlo's restaurant on the Fridays, Saturdays and Sundays during November 2012 are shown in the table, together with an n-point moving average

Date	**2**	**3**	**4**	**9**	**10**	**11**	**16**	**17**	**18**	**23**	**24**	**25**	**30**
Day	**Fr**	**Sa**	**Su**	**Fr**	**Sa**	**Su**	**Fr**	**Sa**	**Su**	**Fr**	**Sa**	**Su**	**Fr**
Number	71	77	59	77	86	66	76	95	85	94	104	82	102
Moving average		69	71	74	76.3	76	79	85.3	91.3	94.3	93.3	*a*	

These data have been plotted on the graph opposite, along with a trend line.

(a)

i. State the value of n.

(1 mark)

ii. Calculate the value of the missing moving average, a, and plot this value on the graph.

(2 marks)

(b)

i. Estimate the seasonal effect for Saturday.

(3 marks)

ii. Hence forecast the number of customers on Saturday 1 December 2012.

(3 marks)

iii. State one reason why the data for November may not provide an accurate forecast for the number of customers at Carlo's restaurant on each Friday, Saturday and Sunday during December.

(1 mark)

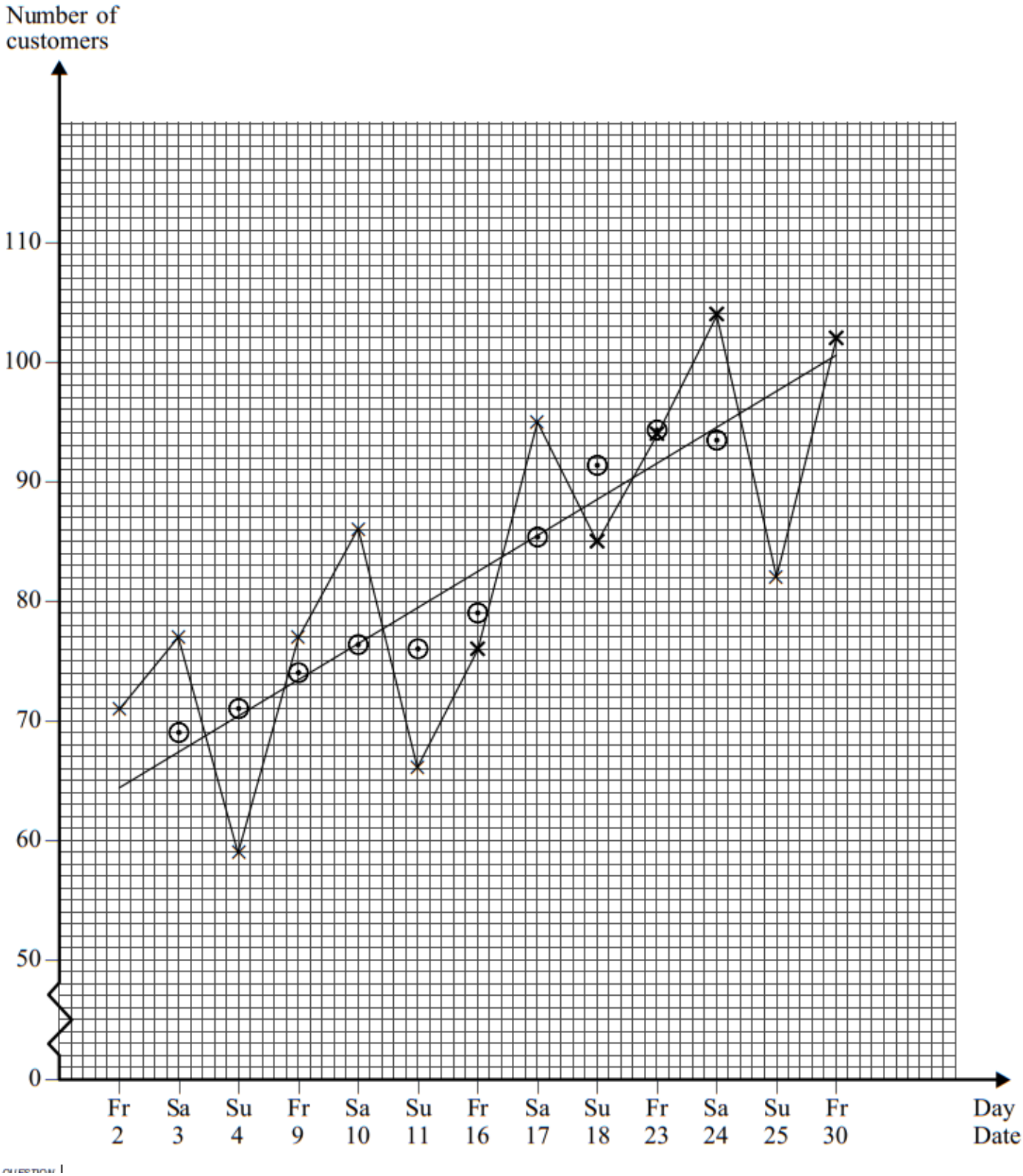
(c) During November, there was bad weather on one of the days listed in the table, making travel difficult. Also, on a different day listed in the table, Carlo ran a promotion that offered, 'Free glass of wine or soft drink with each meal'. Using the graph, state, with a reason, on which date it is likely that:

i. the bad weather occurred;

(2 marks)

ii. the promotion was offered.

(2 marks)


Number of customers
110
100
90
80
70
60
50
0
Fr 2
Sa 3
Su 4
Fr 9
Sa 10
Su 11
Fr 16
Sa 17
Su 18
Fr 23
Sa 24
Su 25
Fr 30
Day
Date

AQA_June_2013_6

Table 1 shows the areas in Canada planted with field crops and special crops during the period 2007 to 2011.

Table 1

Field and special crops (Seeded area in thousands of hectares)					
Year	**2007**	**2008**	**2009**	**2010**	**2011**
Field crops					
All wheat	8 849.5	10 192.4	10 065.3	8 549.6	8 718.1
Canola	6 376.2	6 539.6	6 687.3	7 125.8	7 633.2
Barley	4 396.8	3 786.6	3 505.9	2 796.6	2 619.1
Oats	2 188.4	1 758.4	1 510.1	1 219.3	1 258.0
Flaxseed	528.0	631.3	692.0	374.3	281.2
Rye	167.9	168.0	167.9	131.5	105.3
Soybeans	1 180.1	1 202.4	1 395.3	1 483.0	1 549.9
Corn for grain	1 391.5	1 204.0	1 203.5	1 214.3	1 217.7
Tame hay	8 239.2	8 201.6	8 183.1	8 168.3	7 967.4
Special crops					
Canary seed	178.1	167.9	149.8	159.8	95.1
Lentils	580.8	706.2	971.3	1 408.3	1 040.0
Sunflower seed	80.9	68.8	64.7	54.6	14.2
Mustard seed	186.2	194.2	212.4	194.2	127.5
Dry peas	1 469.0	1 616.6	1 521.7	1 466.9	942.0

Source: *Statistics Canada*, 2011

(a) Find the difference between the seeded area of dry peas and the seeded area of lentils in Canada in 2008**.**

(2 marks)

(b) Find the mean seeded area of flaxseed in Canada during the period 2007 to 2011 inclusive.

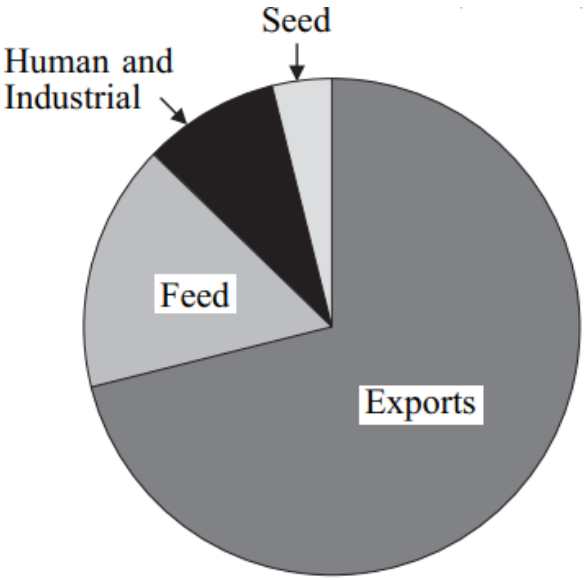
(2 marks)

(c) You may assume that fields planted with wheat produce an average of 2.2 tonnes of wheat per hectare. The pie chart and Table 2 below indicate the uses to which Canadian wheat is put. Using the information provided in Table 1, Table 2 and the pie chart, estimate, to the nearest 100 000 tonnes, the number of tonnes of Canadian wheat exported during 2011.

(4 marks)

Table 2

Use	Angle
Exports	256°
Feed	58°
Human and Industrial	32°
Seed	14°



(d) Three scatter diagrams were drawn of the data for Canada for the years 2007 to 2011, in each case with seeded area of barley on the horizontal axis and a different field crop on the vertical axis. Figures 1, 2 and 3 show sketches of the regression lines obtained. The three field crops were oats, soybeans and corn for grain

Figure 1

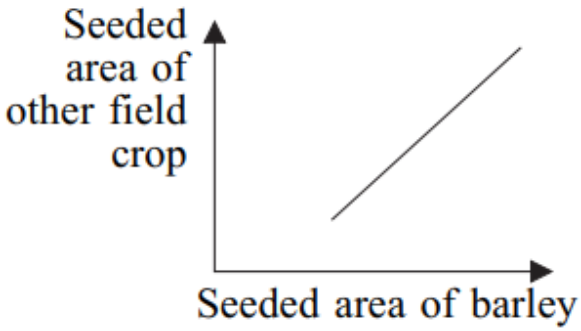


Figure 2

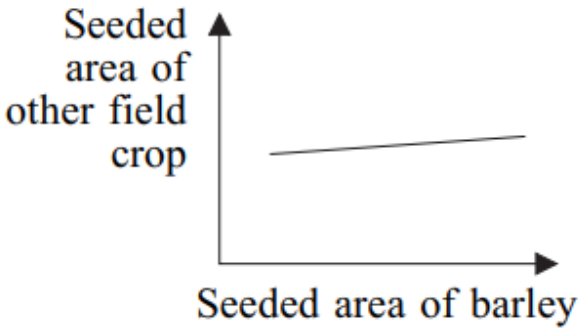
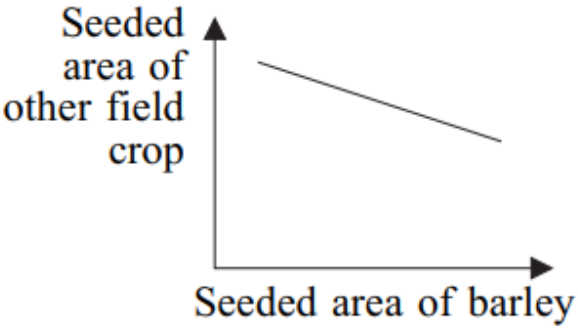


Figure 3



By considering the data in Table 1, state, with a reason, which of the three field crops, oats, soybeans or corn for grain, is most likely to have been on the vertical axis in:

i. Figure 1;
ii. Figure 2;
iii. Figure 3.

(3 marks)

AQA_June_2012_3

The US Geological Survey detects and records earthquakes throughout the world. The table shows the data collected for the United States over the ten-year period 2000–2009.

Number of earthquakes in the United States for 2000–2009 located by the US Geological Survey National Earthquake Information Center

Year / Magnitude	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
8.0 to 8.9	0	0	0	0	0	0	0	0	0	0
7.0 to 7.9	0	1	1	2	0	1	0	1	0	0
6.0 to 6.9	6	5	4	7	2	4	7	9	9	6
5.0 to 5.9	63	41	63	54	25	47	51	72	85	53
4.0 to 4.9	281	290	536	541	284	345	346	366	432	293
3.0 to 3.9	917	842	1535	1303	1362	1475	1213		1486	1491
2.0 to 2.9	660	646	1228	704	1336	1738	1145	1173	1573	2372
1.0 to 1.9	0	2	2	2	1	2	7	11	13	25
0.1 to 0.9	0	0	0	0	0	0	1	0	0	1
No magnitude	415	434	507	333	540	73	13	22	20	16
Total	2342	2261	3876	2946	3550	3685	2783	2791	3618	4257

Source: US Geological Survey, 2010

(a) The number of earthquakes of magnitude 3.0 to 3.9 for the year 2007 is missing from the table. Evaluate this number.

(2 marks)

(b) Calculate the mean number of earthquakes per year classed as magnitude 6.0 or greater.

(2 marks)

AQA_June_2011_1

A club introduces a weekly drum-and-bass night hosted by a DJ. The manager uses three DJs named Ed, Ja and Riz in rotation. For the first eleven weeks, the table shows the DJs used, the attendances and the values of a suitable moving average.

Week	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
DJ	**Ed**	**Ja**	**Riz**	**Ed**	**Ja**	**Riz**	**Ed**	**Ja**	**Riz**	**Ed**	**Ja**
Attendance	312	351	431	363	391	492	394	421	542	451	458
Moving average		364.7	381.7	395.0	415.3	425.7	435.7	452.3	471.3	483.7	

The graph below shows the attendances.

(a)

i. Add the moving averages to the graph opposite and draw a trend line.

(2 marks)

ii. Estimate the 'seasonal' effect for Riz.

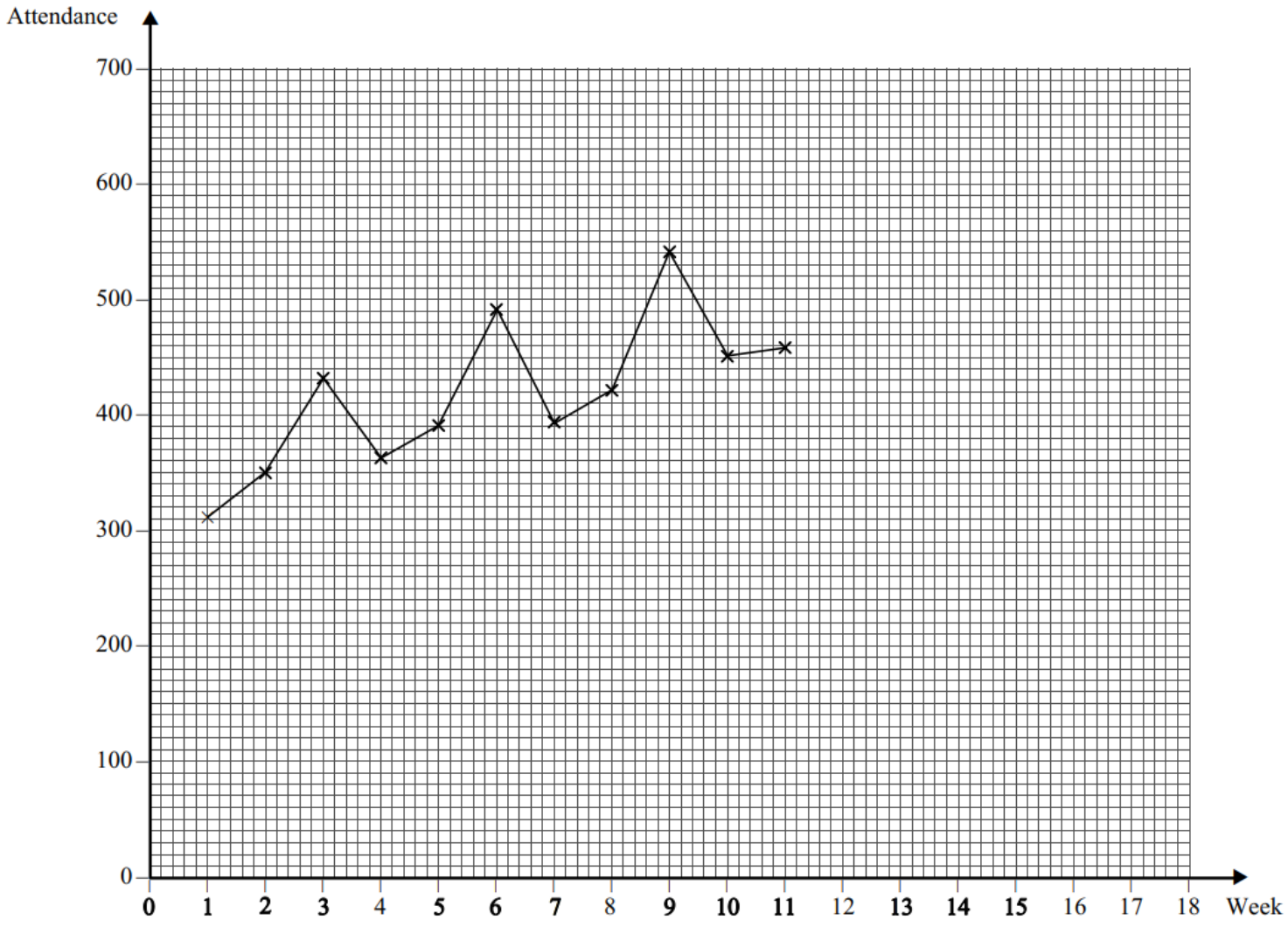
(3 marks)

iii. Forecast the attendance in week 15 when Riz is the DJ.

(3 marks)

(b) For safety reasons, the attendance must be limited to 640 . If the manager thinks this limit may be reached, extra security staff must be employed. Advise the manager in which week it is likely that the extra security staff will first be needed if he continues to use the three DJs in the same rotation and current trends in attendance continue. Explain your answer.

(3 marks)



AQA_June_2011_3

The table below shows the age distribution, in total and by sex, of the resident population of the United Kingdom as enumerated in each census from 1901 to 2001.

	United Kingdom population enumerated in Census — Thousands						
	1901	**1931**	**1951**	**1971**	**1981**	**1991**	**2001**
Persons: All ages	38 237	46 038	50 225	55 928	56 357	57 439	59 114
Under 1	938	712	773	899	730	790	663
1–4	3 443	2 818	3 553	3 654	2 726	3 077	2 819
5–9	4 106	3 897	3 689	4 684	3 677	3 657	3 735
10–14	3 934	3 746	3 310	4 232	4 470	3 485	3 890
15–19	3 826	3 989	3 175	3 862	4 735	3 719	3 678
20–29	6 982	7 865	7 154	7 968	8 113	9 138	7 499
30–44	7 493	9 717	11 125	9 797	10 956	12 125	13 405
45–59	4 639	7 979	9 558	10 202	9 540	9 500	11 168
60–64	1 067	1 897	2 422	3 222	2 935	2 888	2 884
65–74	1 278	2 461	3 689	4 764	5 195	5 067	4 947
75–84	470	844	1 555	2 159	2 677	3 119	3 296
85 and over	61	113	224	485	603	873	1 130
Males: All ages	18 492	22 060	24 118	27 167	27 412	27 909	28 832
Under 1	471	361	397	461	374	403	338
1–4	1 719	1 423	1 818	1 874	1 400	1 572	1 445
5–9	2 052	1 967	1 885	2 401	1 889	1 871	1 913
10–14	1 972	1 892	1 681	2 175	2 295	1 784	1 993
15–19	1 898	1 987	1 564	1 976	2 424	1 905	1 879
20–29	3 293	3 818	3 509	4 024	4 103	4 578	3 744
30–44	3 597	4 495	5 461	4 938	5 513	6 045	6 645
45–59	2 215	3 753	4 493	4 970	4 711	4 732	5 534
60–64	490	894	1 061	1 507	1 376	1 390	1 412
65–74	565	1 099	1 560	1 999	2 264	2 272	2 308
75–84	196	335	617	716	922	1 146	1 308
85 and over	23	36	70	126	141	212	312
Females: All ages	19 745	23 978	26 107	28 761	28 946	29 530	30 281
Under 1	466	351	376	437	356	387	324
1–4	1 724	1 397	1 735	1 779	1 327	1 505	1 375
5–9	2 054	1 930	1 804	2 283	1 788	1 786	1 822
10–14	1 962	1 854	1 629	2 057	2 175	1 701	1 897
15–19	1 928	2 002	1 611	1 887	2 311	1 815	1 799
20–29	3 690	4 047	3 644	3 945	4 009	4 560	3 755
30–44	3 895	5 222	5 663	4 859	5 442	6 080	6 760
45–59	2 424	4 226	5 065	5 231	4 829	4 769	5 634
60–64	577	1 003	1 361	1 715	1 559	1 498	1 473
65–74	713	1 361	2 127	2 765	2 931	2 795	2 640
75–84	274	509	937	1 443	1 756	1 972	1 987
85 and over	38	77	154	359	462	661	817

Source: *Annual Abstract of Statistics*, Office for National Statistics, 2008

(a) How many males aged '20–29' were enumerated in the 1951 census?

(2 marks)

(b) The total of persons aged 'Under 1' enumerated in the 1901 census is not equal to the number of males aged 'Under 1' plus the number of females aged 'Under 1' enumerated in this census. Does this show that there must be an error in the data? Justify your answer.

(2 marks)

(c) To what extent, if at all, does the table opposite provide evidence to support each of the following two common beliefs? Justify your answers.

i. The probability of a baby being female is 0.5 .

(2 marks)

ii. On average, females live longer than males.

(2 marks)

AQA_June_2010_5

The table shows estimates of the remaining recoverable oil reserves for the United Kingdom.

	1995	1998	1999	2000	2001	2002	2003	2004	2005	2006
Oil (million tonnes)										
Reserves										
Proven	605	685	665	630	605	593	571	533	516	479
Probable	765	575	455	380	350	327	286	283	300	298
Proven plus Probable	1370	1260	1120	1010	955	920	857	816	816	776
Possible	520	540	545	480	475	425	410	512	451	
Maximum	1890	1800	1665	1490	1430	1344	1267	1328	1267	1254
Expected level of reserves										
Opening stocks	1975	1675	1535	1370	1235	1160	1192	1180	1212	1162
Extraction	−130	−132	−137	−126	−117	−117	−106	−95	−85	−77
Other volume changes	−95	−8	−28	−9	42	149	94	127	35	130
Closing stocks	1750	1535	1370	1235	1160	1192	1180	1212	1162	1215
Life expectancy (years)	13	12	10	10	10	10	11	13	14	

Source: *Annual Abstract of Statistics*, Office for National Statistics, 2008

(a)

i. State the estimate of probable oil reserves in 2002.

(2 marks)

ii. Find the estimate of possible oil reserves in 2006.

(2 marks)

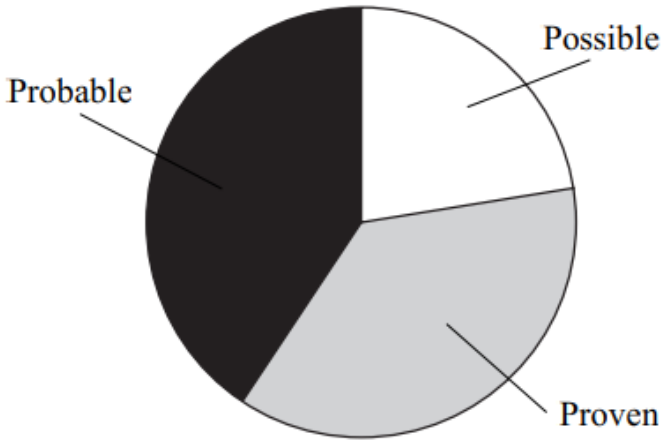
iii. The life expectancy is calculated from the expected closing stocks and current extraction. Find the life expectancy for 2006. Give your answer to an appropriate level of accuracy.

(3 marks)

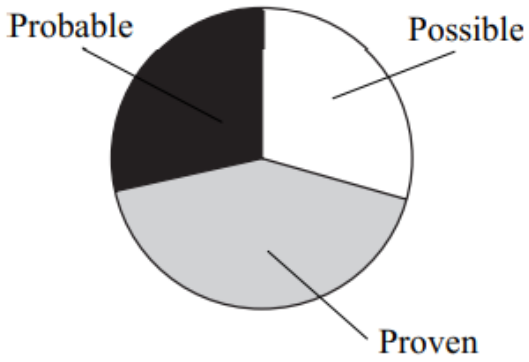
(b) The pie charts show estimates of the remaining gas reserves for the United Kingdom in 1995 and 2006. The area of each chart is proportional to the estimated maximum reserve. Make three statements that can be deduced from these pie charts.

(3 marks)

Gas Reserves 1995



Gas Reserves 2006



Source: *Annual Abstract of Statistics*, Office for National Statistics, 2008

AQA_June_2009_3

Table 3 shows the number of passenger journeys undertaken on local bus services in Great Britain each year from 1994/95 to 2004/05 .

Table 3

Local bus services: passenger journeys: by area

Millions

	1994/ 95	1995/ 96	1996/ 97	1997/ 98	1998/ 99	1999/ 2000	2000/ 01	2001/ 02	2002/ 03	2003/ 04	2004/ 05
Great Britain	4402	4366	4333	4313	4231	4278	4319	4352	4444	4564	4609
London	1155	1193	1230	1281	1266	1294	1347	1422	1527	1692	1782
English Metropolitan Counties	1331	1292	1246	1232	1195	1178	1166	1154	1145	1114	1083
English Shire Counties	1271	1259	1260	1243	1242	1250	1247	1222	1210	1189	1167
All outside London	3247	3173	3103	3032	2965	2984	2972	2930	2917	2871	2828
England	3757	3744	3736	3755	3702	3722	3761	3798	3882	3995	4032
Scotland	513	494	467	438	413	442	443	449	452	457	465
Wales	132	127	130	120	116	114	116	104	110	111	113

Source: Department for Transport and *Annual Abstract of Statistics*, Office for National Statistics, 2006

(a) How many passenger journeys were undertaken on local bus services in Wales during 2004/05?

(2 marks)

(b)

i. Describe the trend over the period 1994/95 to 2004/05 in the number of passenger journeys undertaken on local bus services in London.

ii. Compare this trend with that on local bus services outside London over the same period.

(3 marks)

AQA_June_2008_3

The following tables give details of the elections for the Welsh Assembly in 1999 and 2003, for the Scottish Parliament in 1999 and 2003 and for the Northern Ireland Assembly in 1998 and 2003

Devolved assembly elections

	6 May 1999	1 May 2003
Welsh Assembly		
Electorate (thousands)	2205	2230
Valid votes counted (thousands)	1023	850
As percentage of electorate	46.4	38.1
Number of members elected (by party)		
Conservative	9	11
Labour	28	30
Liberal Democrat	6	6
Plaid Cymru	17	12
Other	0	1
Scottish Parliament		
Electorate (thousands)	4024	3879
Valid votes counted (thousands)	2342	1916
As percentage of electorate	58.2	49.4
Number of members elected (by party)		
Conservative	18	18
Labour	56	50
Liberal Democrat	17	17
Scottish National Party	35	27
Other	3	17

	25 June 1998	26 Nov 2003
Northern Ireland Assembly		
Electorate (thousands)	1179	1098
Valid votes counted (thousands)	810	702
As percentage of electorate	68.7	64.0
Number of members elected (by party)		
Alliance Party	6	6
SDLP	24	18
Sinn Fein	18	24
Democratic Unionist Party	20	30
UK Unionist Party	5	1
Ulster Unionist Party	28	27
Other	7	2

Source: University of Plymouth for the Electoral Commission and *Annual Abstract of Statistics*, Office for National Statistics, 2006

(a) How many valid votes were counted in the election for the Welsh Assembly in 1999?

(2 marks)

(b) Compare the percentages of the electorate who cast valid votes in the six elections.

(3 marks)

(c) In one of the six elections, half of the members elected came from the same party. Identify:

i. the election;

ii. the party.

(3 marks)

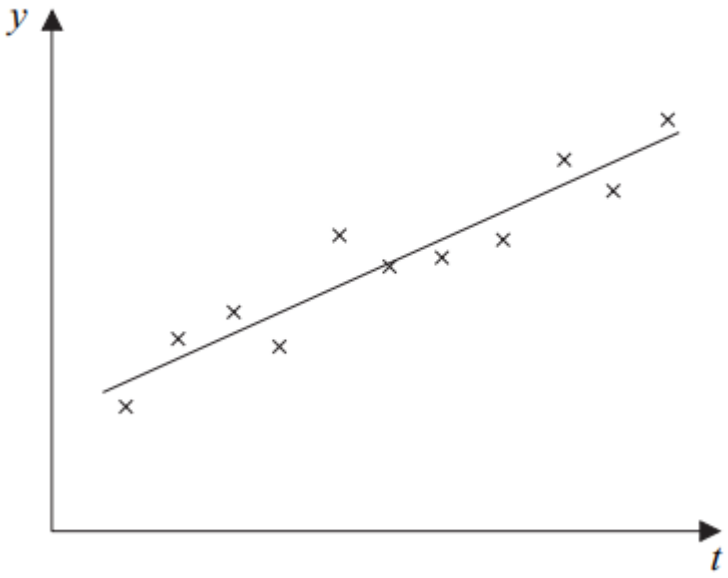
(d) For the 2003 elections, calculate the average electorate per member elected for each of the three countries. Comment briefly on your results.

(3 marks)

AQA_June_2006_3

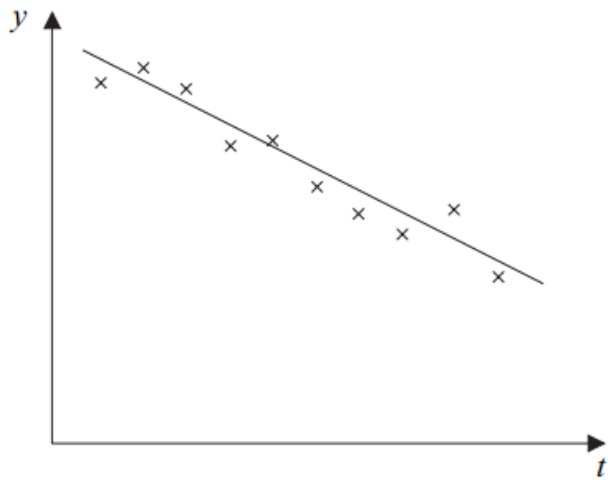
The time series shown in **Figure 2**exhibits random variation about an upward linear trend

Figure 2

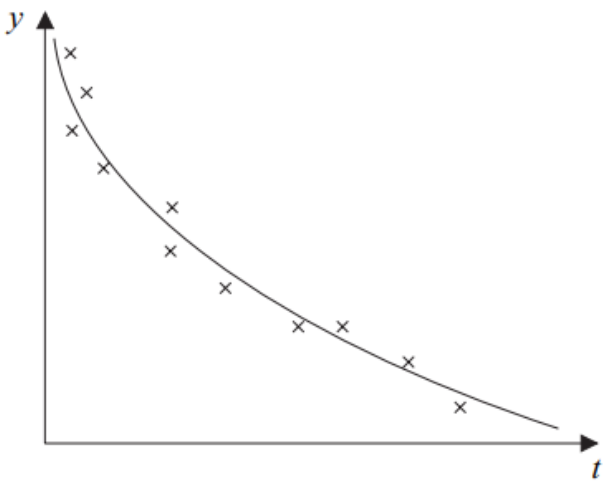


Describe the type of variation and trend in each of the following time series

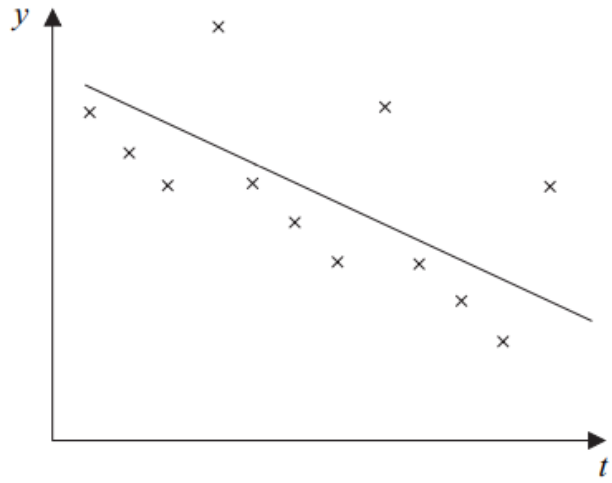
(a)



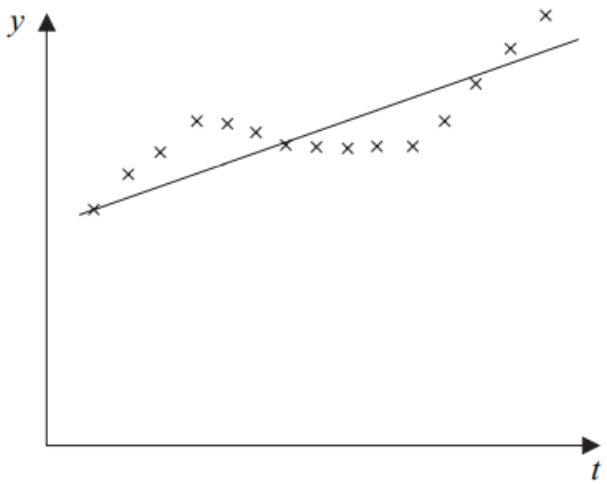
(b)



(c)



(d)



(8 marks)