2 Lakeview and Riverside are two schools. The pupils at both schools took part in a competition to see how far they could throw a ball. The distances thrown, to the nearest metre, by 11 pupils from each school are shown in the following table.

Lakeview	10	14	19	22	26	27	28	30	32	33	41
Riverside	23	36	21	18	37	25	18	20	24	30	25

(a) Draw a back-to-back stem-and-leaf diagram to represent this information, with Lakeview on the left-hand side. [4]

(b) Find the interquartile range of the distances thrown by the 11 pupils at Lakeview school. [2]

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3 The Lions and the Tigers are two basketball clubs. The heights, in cm, of the 11 players in each of their first team squads are given in the table.

Lions	178	186	181	187	179	190	189	190	180	169	196
Tigers	194	179	187	190	183	201	184	180	195	191	197

(a) Draw a back-to-back stem-and-leaf diagram to represent this information, with the Lions on the left. [4]

(b) Find the median and the interquartile range of the heights of the Lions first team squad. [3]

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It is given that for the Tigers, the lower quartile is 183 cm, the median is 190 cm and the upper quartile is 195 cm.

(c) Make two comparisons between the heights of the players in the Lions first team squad and the heights of the players in the Tigers first team squad. [2]

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4 The heights, in cm, of the 11 players in each of two teams, the Aces and the Jets, are shown in the following table.

Aces	180	174	169	182	181	166	173	182	168	171	164
Jets	175	174	188	168	166	174	181	181	170	188	190

(a) Draw a back-to-back stem-and-leaf diagram to represent this information with the Aces on the left-hand side of the diagram. [4]

(b) Find the median and the interquartile range of the heights of the players in the Aces. [3]

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(c) Give one comment comparing the spread of the heights of the Aces with the spread of the heights of the Jets. [1]

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3 The back-to-back stem-and-leaf diagram shows the diameters, in cm, of 19 cylindrical pipes produced by each of two companies, *A* and *B*.

Company *A*							Company *B*				
					4	33	1	2	8		
	9	8	3	2	0	34	1	6	8	9	9
8	7	5	4	1	1	35	1	2	2	3	
		9	6	5	2	36	5	6			
			4	3	1	37	0	3	4		
						38	2	8			

Key: 1 | 35 | 3 means the pipe diameter from company *A* is 0.351 cm and from company *B* is 0.353 cm.

(a) Find the median and interquartile range of the pipes produced by company *A*. [3]

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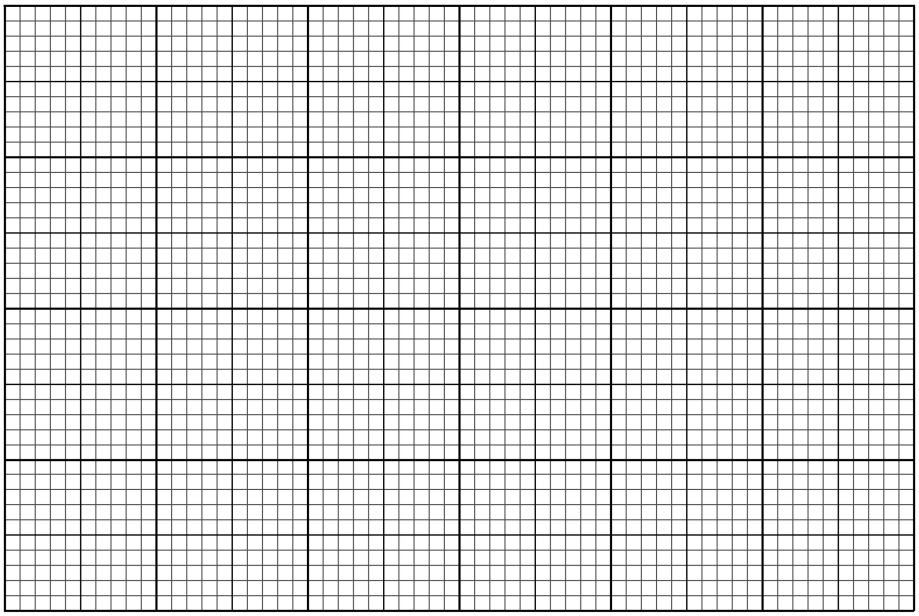
It is given that for the pipes produced by company *B* the lower quartile, median and upper quartile are 0.346 cm, 0.352 cm and 0.370 cm respectively.

(b) Draw box-and-whisker plots for companies *A* and *B* on the grid below. [3]



(c) Make one comparison between the diameters of the pipes produced by companies *A* and *B*. [1]

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3 The following back-to-back stem-and-leaf diagram represents the monthly salaries, in dollars, of 27 employees at each of two companies, A and B.

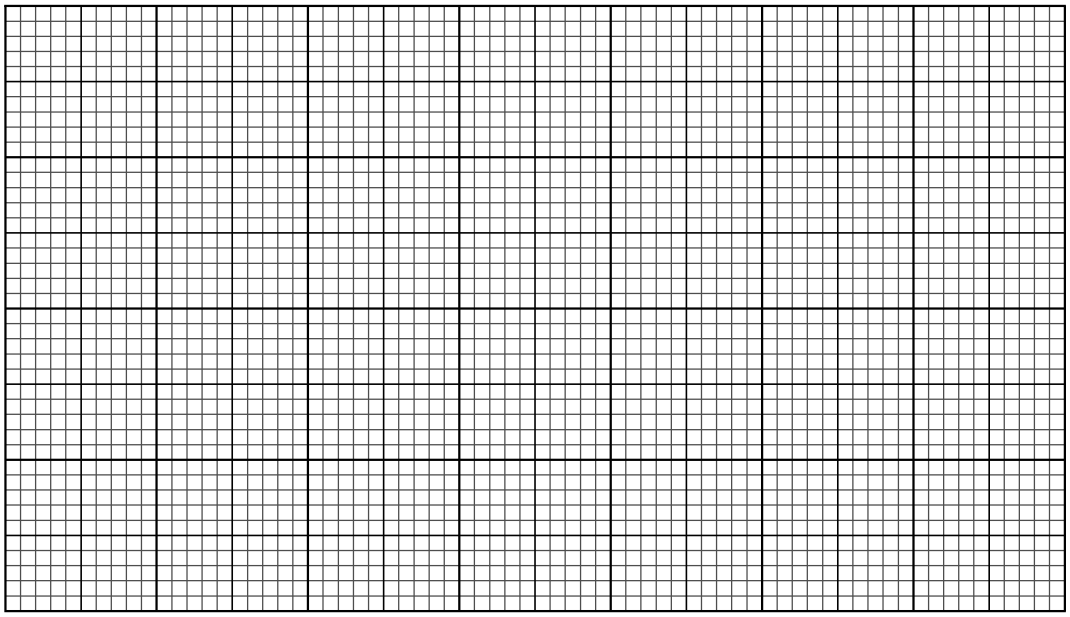
Company A								Company B							
		5	4	1	1	0	25	4	4	5	6	6	7		
9	9	8	7	2	1	0	26	0	1	3	5	5	7	9	9
	8	6	4	2	1	0	27	1	3	4	6	6	8	8	
		6	5	4	2	0	28	0	1	2	2	2			
				9	8	5	29								
						1	30	9							

Key: 1 $\vert$27$\vert$ 6 means \$2710 for company A and \$2760 for company B

(a) Find the median and the interquartile range of the monthly salaries of employees in company A. [3]

The lower quartile, median and upper quartile for company *B* are \$2600, \$2690 and \$2780 respectively.

(b) Draw two box-and-whisker plots in a single diagram to represent the information for the salaries of employees at companies *A* and *B*. [3]



(c) Comment on whether the mean would be a more appropriate measure than the median for comparing the given information for the two companies. [1]

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3 Two machines, A and B, produce metal rods of a certain type. The lengths, in metres, of 19 rods produced by machine A and 19 rods produced by machine B are shown in the following back-to-back stem-and-leaf diagram.

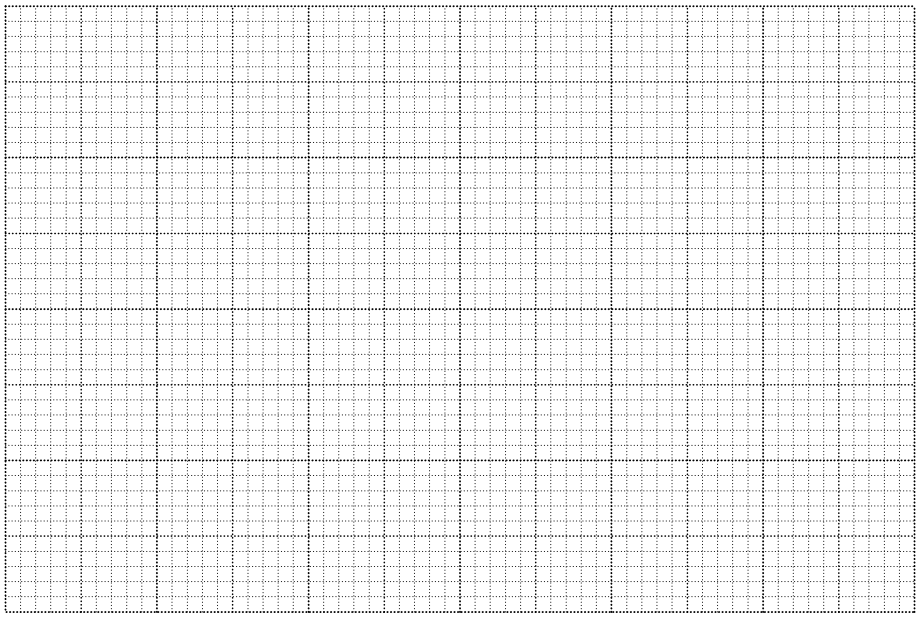
A							B					
						21	1	2	4			
		7	6	3	0	22	2	4	5	5	6	
8	7	4	3	1	1	23	0	2	6	8	9	9
	5	5	5	3	2	24	3	3	4	6		
		4	3	1	0	25	6					

Key: 7 | 22 | 4 means 0.227 m for machine A and 0.224 m for machine B.

(a) Find the median and the interquartile range for machine A. [3]

It is given that for machine B the median is 0.232 m, the lower quartile is 0.224 m and the upper quartile is 0.243 m.

(b) Draw box-and-whisker plots for A and B. [3]



(c) Hence make two comparisons between the lengths of the rods produced by machine A and those produced by machine B. [2]

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6 The weights, in kg, of 15 rugby players in the Rebels club and 15 soccer players in the Sharks club are shown below.

Rebels	75	78	79	80	82	82	83	84	85	86	89	93	95	99	102
Sharks	66	68	71	72	74	75	75	76	78	83	83	84	85	86	92

(a) Represent the data by drawing a back-to-back stem-and-leaf diagram with Rebels on the left-hand side of the diagram. [4]

(b) Find the median and the interquartile range for the Rebels. [3]

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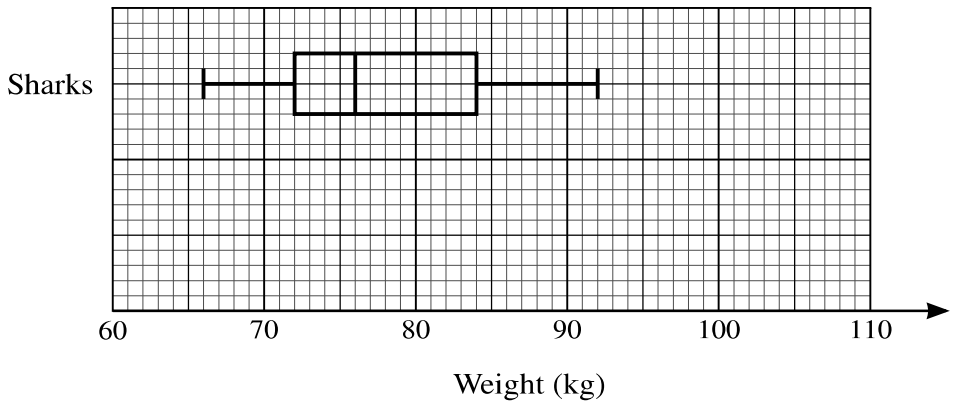
A box-and-whisker plot for the Sharks is shown below.



(c) On the same diagram, draw a box-and-whisker plot for the Rebels. [2]

(d) Make one comparison between the weights of the players in the Rebels club and the weights of the players in the Sharks club. [1]

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5 The following table gives the weekly snowfall, in centimetres, for 11 weeks in 2018 at two ski resorts, Dados and Linva.

Dados	6	8	12	15	10	36	42	28	10	22	16
Linva	2	11	15	16	0	32	36	40	10	12	9

(a) Represent the information in a back-to-back stem-and-leaf diagram. [4]

(b) Find the median and the interquartile range for the weekly snowfall in Dados. [3]

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(c) The median, lower quartile and upper quartile of the weekly snowfall for Linva are 12, 9 and 32 cm respectively. Use this information and your answers to part **(b)** to compare the central tendency and the spread of the weekly snowfall in Dados and Linva. [2]

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4 The times taken, in minutes, to complete a cycle race by 19 cyclists from each of two clubs, the Cheetahs and the Panthers, are represented in the following back-to-back stem-and-leaf diagram.

Cheetahs						Panthers					
			9	8	7	4					
8	7	3	2	0	8	6	8				
		9	8	7	9	1	7	8	9	9	
6	5	3	3	1	10	2	3	4	4	5	6
		9	8	2	11	1	2	8			
				4	12	0	6				

Key: 7 |9| 1 means 97 minutes for Cheetahs and 91 minutes for Panthers

(a) Find the median and the interquartile range of the times of the Cheetahs. [3]

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The median and interquartile range for the Panthers are 103 minutes and 14 minutes respectively.

(b) Make two comparisons between the times taken by the Cheetahs and the times taken by the Panthers. [2]

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Another cyclist, Kenny, from the Cheetahs also took part in the race. The mean time taken by the 20 cyclists from the Cheetahs was 99 minutes.

(c) Find the time taken by Kenny to complete the race. [3]

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6 The annual salaries, in thousands of dollars, for 11 employees at each of two companies *A* and *B* are shown below.

Company *A*	30	32	35	41	41	42	47	49	52	53	64
Company *B*	26	47	30	52	41	38	35	42	49	31	42

(a) Represent the data by drawing a back-to-back stem-and-leaf diagram with company *A* on the left-hand side of the diagram. [4]

(b) Find the median and the interquartile range of the salaries of the employees in company A. [3]

A new employee joins company B. The mean salary of the 12 employees is now \$38 500.

(c) Find the salary of the new employee. [3]

7 The heights, in cm, of the 11 basketball players in each of two clubs, the Amazons and the Giants, are shown below.

Amazons	205	198	181	182	190	215	201	178	202	196	184
Giants	175	182	184	187	189	192	193	195	195	195	204

(a) State an advantage of using a stem-and-leaf diagram compared to a box-and-whisker plot to illustrate this information. [1]

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(b) Represent the data by drawing a back-to-back stem-and-leaf diagram with Amazons on the left-hand side of the diagram. [4]

(c) Find the interquartile range of the heights of the players in the Amazons. [2]

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Four new players join the Amazons. The mean height of the 15 players in the Amazons is now 191.2 cm. The heights of three of the new players are 180 cm, 185 cm and 190 cm.

(d) Find the height of the fourth new player. [3]

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