Chapter 11

Statistics

01. 0607_m23_qp_22 Q: 5

A bag contains 7 black balls, 2 red balls and 4 yellow balls.
One ball is chosen at random from the bag.

Find the probability that the ball chosen is yellow.

..... [1]

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02. 0607_s23_qp_22 Q: 4

Aklima records the masses, m kg, of 120 parcels.
The results are shown in the table.

Mass, m kg	$0 < m \leqslant 2$	$2 < m \leqslant 4$	$4 < m \leqslant 6$	$6 < m \leqslant 8$	$8 < m \leqslant 10$
Frequency	35	30	40	12	3

Find

(a) the modal class

..... $< m \leqslant$ ..... [1]

(b) the class which contains the median.

..... $< m \leqslant$ ..... [1]

---

03. 0607_s23_qp_22 Q: 10

There is correlation between quantity p and quantity q.
The regression equation is $p = 80 - 5.2q$.

What type of correlation is there between p and q?

..... [1]

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04. 0607_s23_qp_23 Q: 11

(a) The range of ten numbers is 30.
The range of eight other numbers is 13.

Find the smallest possible value of the range of all eighteen numbers.

..... [1]

(b) The mean of twelve numbers is 25.
The mean of ten of these numbers is 16.

Find the mean of the other two numbers.

..... [2]

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05. 0607_s22_qp_22 Q: 8

The mean of eight numbers is 25.
When two extra numbers are included the mean of the ten numbers is 24.

Find the mean of the two extra numbers.

..... [2]

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06. 0607_s22_qp_23 Q: 2

This is a list of 8 numbers.

11 7 8 13 7 14 15 5

(a) Find the median.

..... [2]

(b) An extra number is added to the list.
The mean of the nine numbers is 1 more than the mean of the eight numbers.

Find the ninth number.

..... [3]

07. 0607_s22_qp_23 Q: 7

Eggs are graded into four sizes: extra large, large, medium and small.
A farmer records the sizes of a sample of 100 eggs that she collects.
The results are shown in the table.

Size	Extra large	Large	Medium	Small
Number of eggs	28	36	24	12

(a) Find the relative frequency for large eggs.

..... [1]

(b) In one month, the farmer collects 2500 eggs.

Calculate an estimate for the number of these eggs that are small.

..... [2]

08. 0607_w22_qp_21 Q: 7

These are the scores of 10 students in a test.

15 5 20 25 7 13 15 11 17 12

Find

(a) the range,

..... [1]

(b) the mean.

..... [2]

---

09. 0607_w22_qp_22 Q: 1

These are the scores of 10 students in a test.

7 15 9 4 16 6 8 11 12 10

Find

(a) the median,

..... [2]

(b) the mean.

..... [2]

---

10. 0607_m21_qp_22 Q: 1

These are the test results for 14 students.

27	19	22	25	18	23	24
17	16	25	17	27	23	26

(a) Construct an ordered stem-and-leaf diagram to show this information, including a key.

Key: ..... | ..... = ... [3]

(b) Find the median.

..... [1]

---

11. 0607_m21_qp_22 Q: 10

Aisha picks three number cards from a pack.

The mean of the three numbers is $6\frac{1}{3}$.

She picks another card from the pack.

The mean of the four numbers is $6\frac{1}{2}$.

Work out the number on the fourth card.

..... [3]

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12. 0607_s21_qp_22 Q: 2

These are the masses, in kilograms, of 16 newborn babies.

2.5	3.2	3.8	3.2	1.9	3.4	1.7	4.1
3.0	2.8	4.0	2.7	3.9	2.7	4.1	3.7

Complete the ordered stem-and-leaf diagram for the masses.

1	
2	
3	
4	

Key: 3 | 2 = 3.2

[2]

---

13. 0607_s21_qp_22 Q: 13

The heights, h cm, of 100 plants are measured.
The table shows the results.

Height, h cm	Frequency
$0 < h \leqslant 40$	15
$40 < h \leqslant 80$	40
$80 < h \leqslant 120$	45

Calculate an estimate for the mean height of the plants.

..... cm [3]

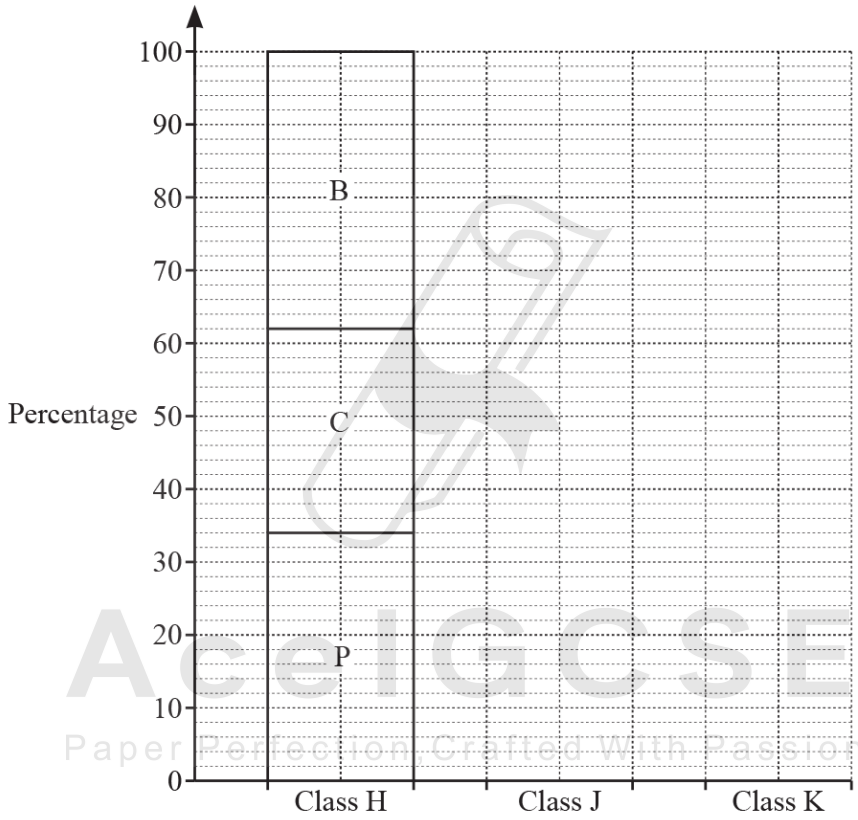
---

14. 0607_w21_qp_21 Q: 4

The table shows the percentage of students in each of three classes who study physics, chemistry and biology.

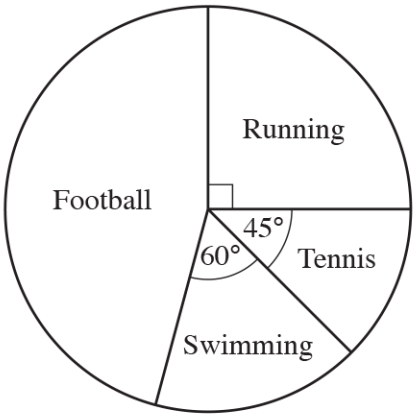
	Physics (P)	Chemistry (C)	Biology (B)
Class H	34	28	38
Class J	24	18	58
Class K	46	32	22

Complete the compound bar chart to show this information.



[3]

15. 0607_s20_qp_22 Q: 11



The pie chart shows the favourite sports of all the students at a school.
180 students chose running as their favourite sport.

Work out

(a) the total number of students at the school,

..... [1]

(b) the number of students that chose football as their favourite sport.

..... [2]

---

16. 0607_w20_qp_21 Q: 6

The mean of 5 numbers is 12.
The mean of 3 of these numbers is 8.

Find the mean of the other two numbers.

..... [3]

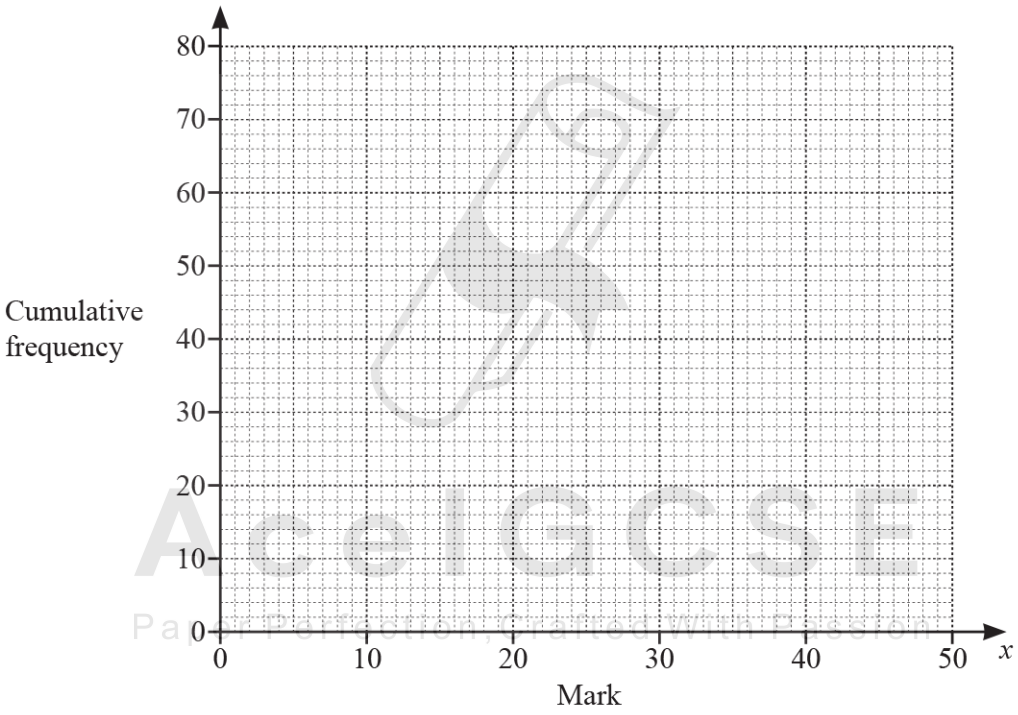
---

17. 0607_w20_qp_21 Q: 12

The table shows the marks of 80 students in an examination.

Mark (x)	Frequency
$0 < x \leqslant 10$	8
$10 < x \leqslant 15$	16
$15 < x \leqslant 20$	25
$20 < x \leqslant 30$	17
$30 < x \leqslant 50$	14

(a) On the grid, draw a cumulative frequency curve to show this information.



[4]

(b) Use your graph to estimate the median mark of the students.

..... [1]

18. 0607_w20_qp_22 Q: 7

5 numbers have a mean of 12.
When a 6th number is included the mean is 9.

Work out the 6th number.

..... [2]

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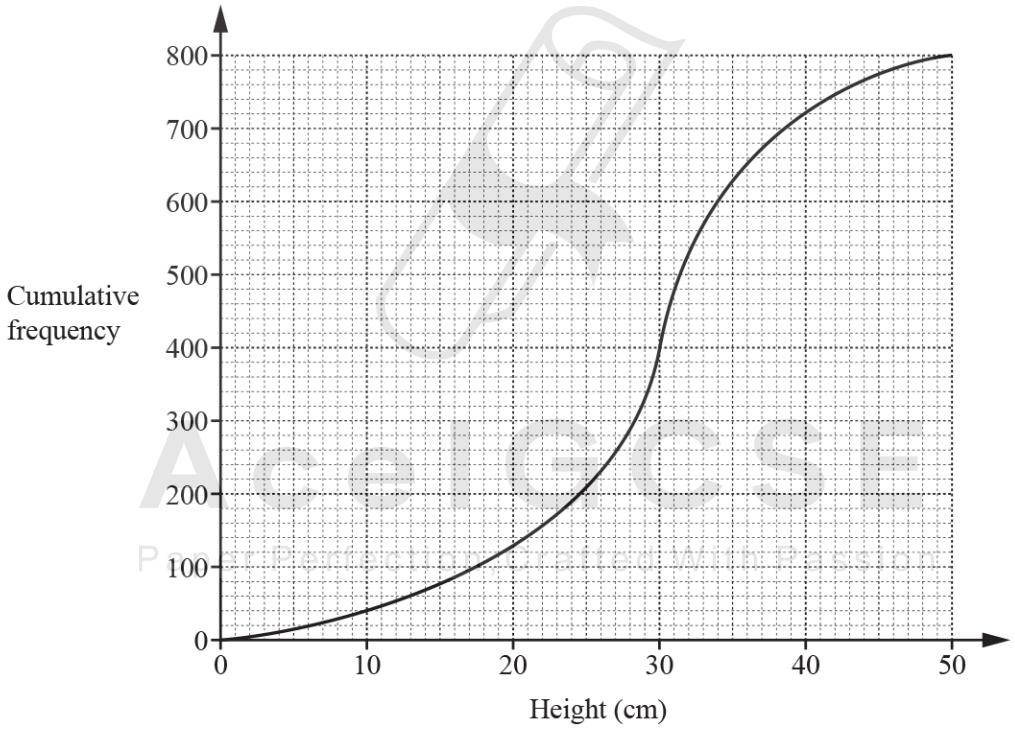
19. 0607_s19_qp_22 Q: 5



The cumulative frequency curve shows some information about the heights of 800 plants.

Find

(a) the median,

..... cm [1]

(b) the upper quartile.

..... cm [1]

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20. 0607_s19_qp_23 Q: 6

16 10 11 15 10 12 14 13 17 10 15

Find the median of these eleven numbers.

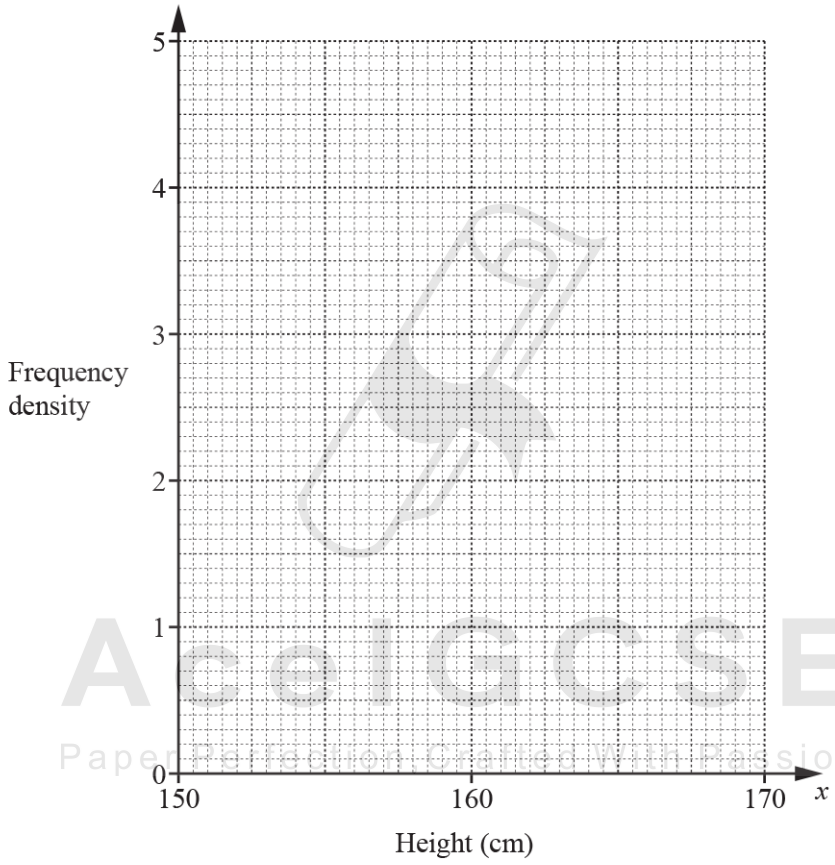
..... [1]

21. 0607_s19_qp_23 Q: 17

The table shows the heights, x cm, of some students at a school.

Height (x cm)	Frequency
$150 < x \leqslant 160$	8
$160 < x \leqslant 165$	20
$165 < x \leqslant 170$	24

On the grid below, draw a histogram to show this information.



[3]

22. 0607_w19_qp_22 Q: 9

The mean of five numbers is 16.
When two extra numbers are included the mean of the seven numbers is 20.

Find the mean of the two extra numbers.

..... [2]

---

23. 0607_w19_qp_23 Q: 7

The mean of 10 numbers is 15.
When an 11th number is included, the mean is 16.

Find the 11th number.

..... [2]

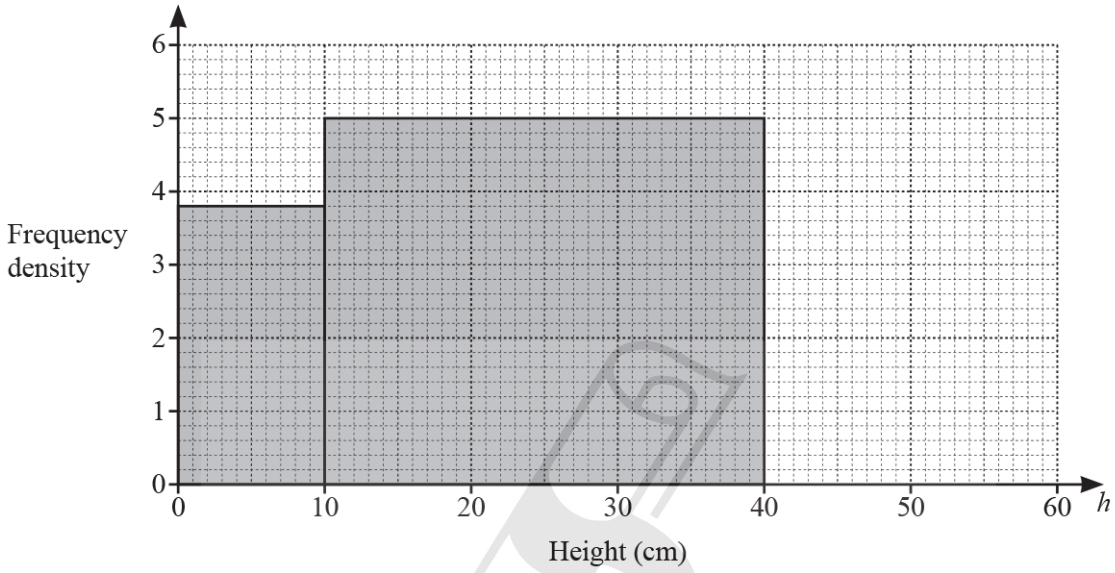
---

24. 0607_w19_qp_23 Q: 15

The table shows the height, h cm, of some plants.

Height (h cm)	$0 < h \leqslant 10$	$10 < h \leqslant 40$	$40 < h \leqslant 60$
Frequency	p	q	44

(a) Complete the histogram to show this information.



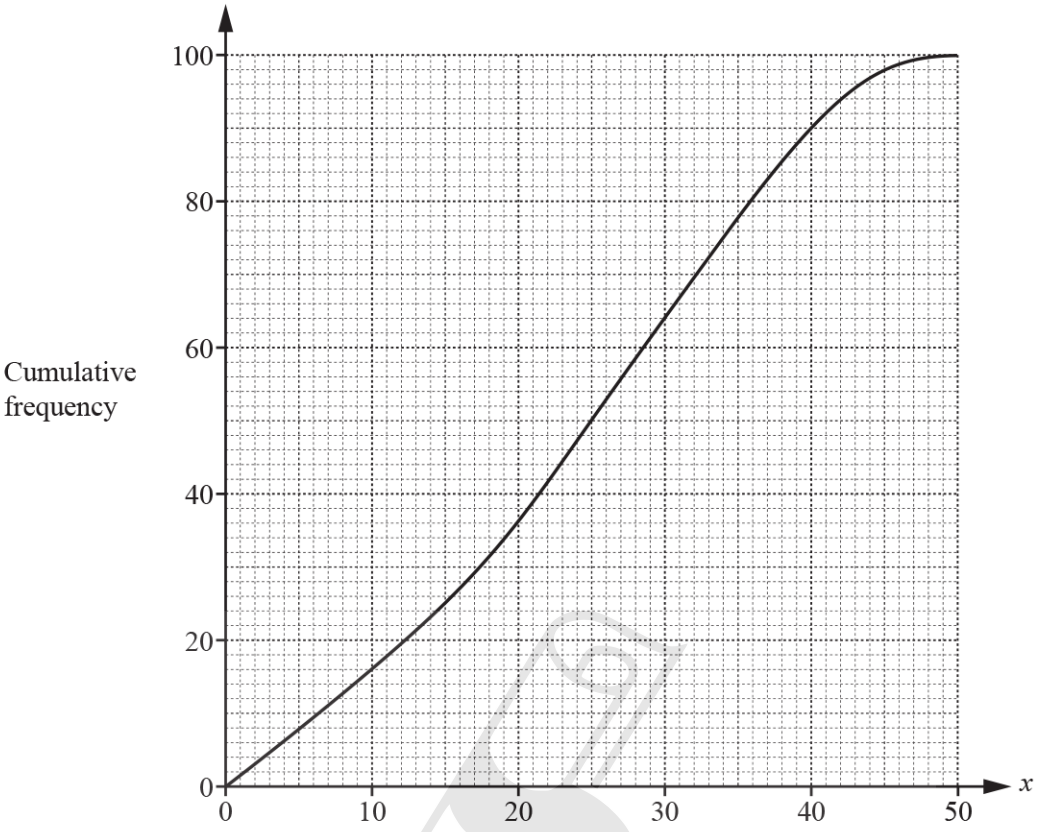
[1]

(b) Find the value of p and the value of q.

p = ...

q = ... [2]

25. 0607_s18_qp_22 Q: 10



Use the cumulative frequency curve to estimate the inter-quartile range.

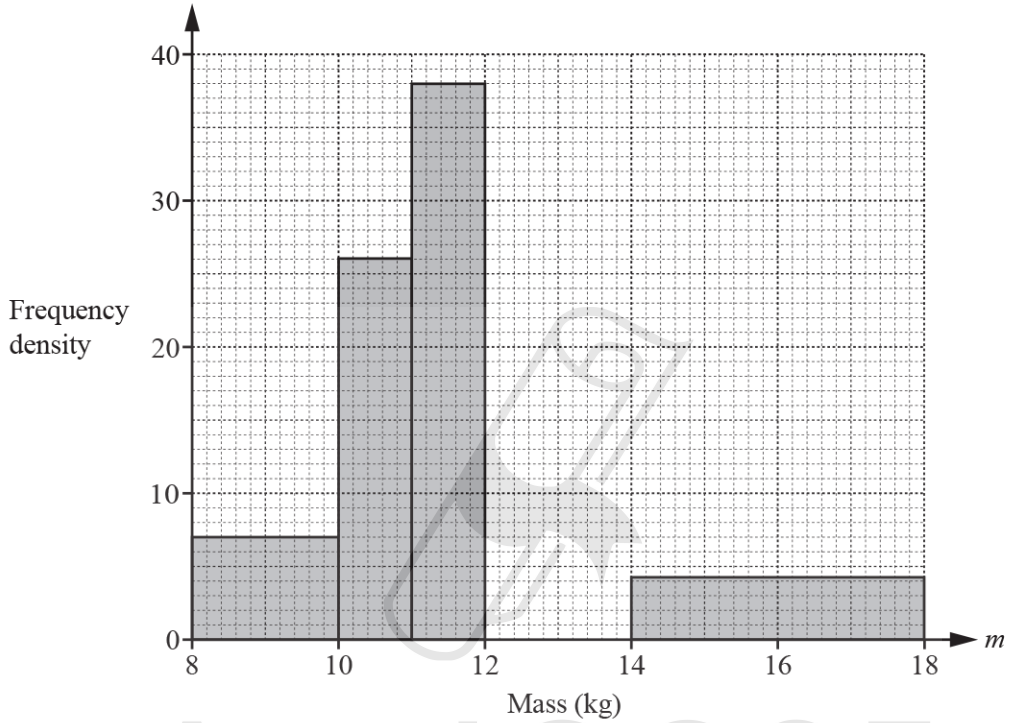
..... [2]

26. 0607_s18_qp_23 Q: 13

The masses, m kg, of some watermelons are measured.
The results are shown in the table.

Mass (m kg)	$8 < m \leqslant 10$	$10 < m \leqslant 11$	$11 < m \leqslant 12$	$12 < m \leqslant 14$	$14 < m \leqslant 18$
Frequency	p	26	38	24	17

Part of the histogram to show this information is shown below.



(a) Complete the histogram. [2]

(b) Find the value of p.

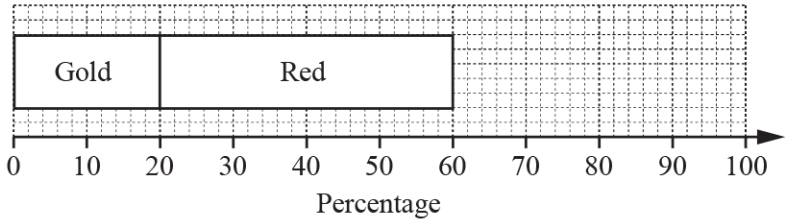
$p =$ ..... [1]

27. 0607_w18_qp_22 Q: 9

An archer shoots 150 arrows at a target with sections coloured gold, red, blue, black and white.
The table shows her results.

Colour	Gold	Red	Blue	Black	White
Frequency	30	60	36	15	9

Complete the **compound** bar chart to show these results as percentages.



[3]

28. 0607_s17_qp_22 Q: 2

These are the number of points *The Storm* have scored in their last 20 basketball matches.

28	33	49	37	26
54	46	48	53	34
26	17	46	41	52
48	37	30	45	53

(a) Construct an ordered stem and leaf diagram to show these scores and complete the key.

Key ..... | ..... = 53 [3]

(b) Find the median score.

..... [1]

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29. 0607_w17_qp_23 Q: 9

The mean of two numbers is 46.
The difference between the two numbers is 12.

Find the two numbers.

..... and ..... [2]

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01. 0607_m23_ms_22 Q: 5

Question	Answer	Marks	Partial Marks
	$\frac{4}{13}$	**1**	

02. 0607_s23_ms_22 Q: 4

Question	Answer	Marks	Partial Marks
(a)	$4 [< m \leqslant] 6$	**1**	
(b)	$2 [< m \leqslant] 4$	**1**	

03. 0607_s23_ms_22 Q: 10

Question	Answer	Marks	Partial Marks
	Negative	**1**	

04. 0607_s23_ms_23 Q: 11

Question	Answer	Marks	Partial Marks
(a)	30	**1**	
(b)	70	**2**	**M1** for 12×25 or 10×16

05. 0607_s22_ms_22 Q: 8

Question	Answer	Marks	Partial Marks
	20	**2**	**M1** for 10×24 or 8×25

06. 0607_s22_ms_23 Q: 2

Question	Answer	Marks	Partial Marks
(a)	9.5 oe	**2**	**M1** for 5 7 7 8 11 ... or (8 + 11) ÷ 2
(b)	19	**3**	**M1** for attempt at mean (5 + 7 + 7 + 8 ..+ 15) / 8 **M1** for 9 × (*their* 10 + 1)

07. 0607_s22_ms_23 Q: 7

Question	Answer	Marks	Partial Marks
(a)	$\frac{36}{100}$ or $\frac{9}{25}$ oe	**1**	
(b)	300	**2**	**M1** for $12 \times \frac{2500}{100}$ oe

08. 0607_w22_ms_21 Q: 7

Question	Answer	Marks	Partial Marks
(a)	20	**1**	
(b)	14	**2**	**M1** for (15 + 5 + 20 + 25 +….)/10

09. 0607_w22_ms_22 Q: 1

Question	Answer	Marks	Partial Marks
(a)	9.5	**2**	**M1** for 4, 6, 7, 8, 9, 10, 11, 12, 15, 16 Ordered as far as 10 forwards or 9 backwards
(b)	9.8	**2**	**M1** for (7 + 15 + 16 + 4 ...) ÷ 10

10. 0607_m21_ms_22 Q: 1

Question	Answer	Marks	Partial Marks
(a)	1 | 6 7 7 8 9 2 | 2 3 3 4 5 5 6 7 7 key e.g. 1 | 6 = 16	**3**	**B1** for one row correct or for all numbers in correct rows but unordered **B1** for a correct key
(b)	23	**1**	

11. 0607_m21_ms_22 Q: 10

Question	Answer	Marks	Partial Marks
	7	3	**M2** for $6\frac{1}{2}\times 4 - 6\frac{1}{3}\times 3$ or **M1** for either correct OR **M2** for $2(19+x)=13\times 4$ oe or **M1** for $\frac{6\frac{1}{3}\times 3+x}{4}=6\frac{1}{2}$ oe

12. 0607_s21_ms_22 Q: 2

Question	Answer	Marks	Partial Marks
	1 | 7 9 2 | 5 7 7 8 3 | 0 2 2 4 7 8 9 4 | 0 1 1	2	**B1** for 12 or more correct or all values in correct rows but unordered.

13. 0607_s21_ms_22 Q: 13

Question	Answer	Marks	Partial Marks
	72	3	**M2** for $\frac{15\times 20+40\times 60+45\times 100}{100}$ or **M1** for $\frac{\textit{their}(20)\times 15+\textit{their}(60)\times 40+\textit{their}(100)\times 45}{100}$ or use correct mid-points but not totalled

14. 0607_w21_ms_21 Q: 4

Question	Answer	Marks	Partial Marks
	Correct bar chart	3	**B2** for 1 correct column or **B1** for bottom bar on each column correct If 0 scored, **SC1** for bar sections correct heights but in inconsistent order or unequal widths.

15. 0607_s20_ms_22 Q: 11

Question	Answer	Marks	Partial Marks
(a)	720	1	
(b)	330	2	**M1** for $\frac{360-(90+45+60)}{360}$ [×*their*(*a*)]

16. 0607_w20_ms_21 Q: 6

Question	Answer	Marks	Partial Marks
	18	3	**M2** for $(5\times12-3\times8)$ [÷2] or **M1** for 5×12 or 3×8

17. 0607_w20_ms_21 Q: 12

Question	Answer	Marks	Partial Marks
(a) and (b) are dependent on an increasing curve.			
(a)	Correct graph passing through (0, 0) (10, 8) (15, 24) (20, 49) (30, 66) (50, 80)	4	**B2** for correct vertical plots or **B1** for 3 or 4 correct vertical plots or all cf's seen correct **B1** for plotting points at upper group limit **B1** for smooth curve
(b)	17 to 19	1	**FT** *their* curve

18. 0607_w20_ms_22 Q: 7

Question	Answer	Marks	Partial Marks
	–6	2	**M1** for 5×12 or 6×9

19. 0607_s19_ms_22 Q: 5

Question	Answer	Marks	Partial Marks
(a)	30	1	
(b)	34	1	Allow 33 – 35

20. 0607_s19_ms_23 Q: 6

Question	Answer	Marks	Partial Marks
	13	1	

21. 0607_s19_ms_23 Q: 17

Question	Answer	Marks	Partial Marks
	Correct histogram	3	**B2** for 3 correct heights 0.8, 4, 4.8 or **B1** for 2 correct heights or all widths correct If 0 scored, **SC1** for 0.8, 4, 4.8 seen

22. 0607_w19_ms_22 Q: 9

Question	Answer	Marks	Partial Marks
	30	2	**M1** for $7\times20-5\times16$

23. 0607_w19_ms_23 Q: 7

Question	Answer	Marks	Partial Marks
	26	2	**B1** for 150 or 176 seen

24. 0607_w19_ms_23 Q: 15

Question	Answer	Marks	Partial Marks
(a)	Bar from 40 to 60, height 2.2	1	
(b)	[p =] 38 [q =] 150	2	**B1** for each

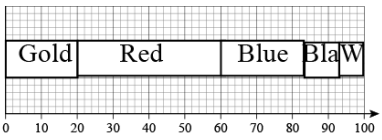
25. 0607_s18_ms_22 Q: 10

Question	Answer	Marks	Partial Marks
	19	2	**B1** for 15 or 34

26. 0607_s18_ms_23 Q: 13

Question	Answer	Marks	Partial Marks
(a)	Bar from 12 to 14, of height 12	2	**B1** for 12 seen
(b)	14	1	

27. 0607_w18_ms_22 Q: 9

Question	Answer	Marks	Partial Marks
	Labelled chart 	3	**B2** for three correct rectangles or **B1** for one correct rectangle **B1** for labels or for 24, 10, 6

28. 0607_s17_ms_22 Q: 2

Question	Answer	Marks	Partial Marks
(a)	1 | 7 2 | 6 6 8 3 | 0 3 4 7 7 4 | 1 5 6 6 8 8 9 5 | 2 3 3 4 Key 5 | 3 = 53	**3**	**B2** for all elements correct or **B1** for all 'correct' but unordered or 1 or 2 missing or wrongly placed or extra element(s) **B1** for key
(b)	43	**1**	

29. 0607_w17_ms_23 Q: 9

Question	Answer	Marks	Partial Marks
	40 and 52	**2**	**B1** for 92