11 – Statistics

Student name: _____Answers_____ Score: _____

1. One morning, Ashad carries out a survey on the colours of 200 cars in his town.
These are his results.

Colour	Silver	Black	Red	Blue	Other
Frequency	78	40	36	30	16

(a) Complete this table of relative frequencies.

Colour	Silver	Black	Red	Blue	Other
Relative Frequency	0.39	0.2	0.18	0.15	0.08

[2]

(b) There is a total of 18 000 cars in the town.
Work out an estimate of the number of black cars in the town.

Answer (b) 3600………. [2]

2. In one month there were 120 new cars sold in a town.

The table shows how many cars of each colour were sold.

Colour	Red	Blue	White	Green	Silver	Black	Yellow
Number	17	20	24	x	28	17	x

(a) Find the value of x.

Answer (a) 7…………. [1]

(b) Find the relative frequency of white cars, giving your answer as a fraction in its lowest terms.

Answer (b) $\dfrac{1}{5}$………… [2]

3.   11   16   8   9   14   6   20   16   12   10
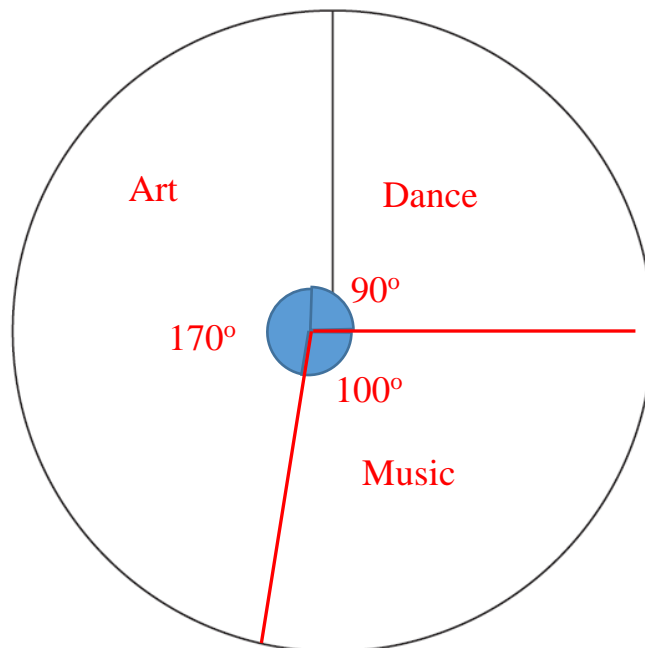
Find the median of these ten numbers.

Answer ……11.5……….. [2]

4. In a year group of a school, students study one subject from art, music or dance.
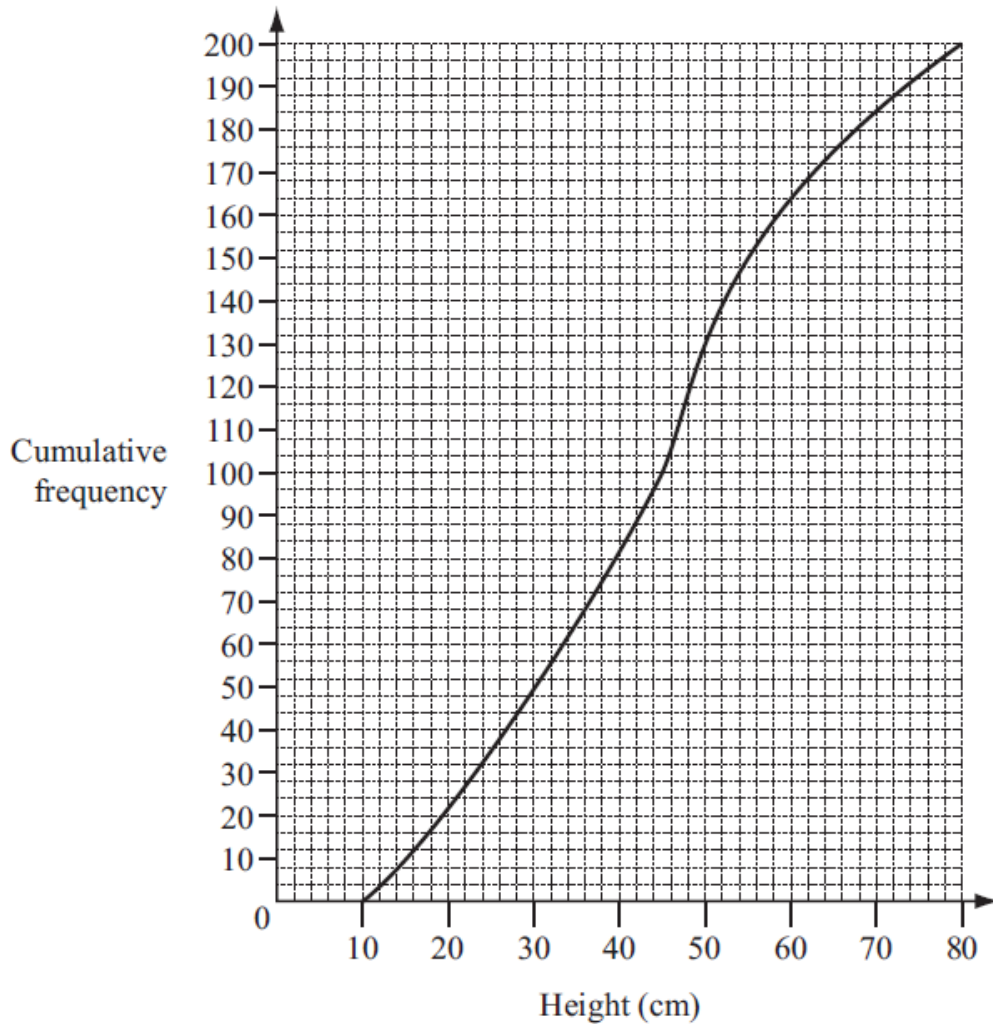
The table shows the choices of the 180 students.

Subject	Number of students
Art	85
Music	50
Dance	45

Use the circle to draw a pie chart to show this information.

Art

Dance

90º

170º

100º

Music

[3]

5. The cumulative frequency curve shows the heights of 200 plants measured correct to the nearest centimetre.

(a) Use the graph to find

(i) the median,

Answer (a)(i) ..45............ cm [1]

(ii) the interquartile range.

Answer (a)(ii) 25............ cm [2]

(b) Find the percentage of plants with heights greater than 50 cm.

Answer(b) ....34 to 36........% [2]

6. 31 students took a test which was marked out of 70.

The stem and leaf diagram shows their results.

```
1 | 3 3 4 7
2 | 4 4 7 8 9          Key    2 | 4  = 24 marks
3 | 3 3 4 6 7 8
4 | 0 2 5 5 8 9 9
5 | 3 4 6 7 8
6 | 2 5 5 7
```

(a) Find the median.

Answer(a) ...40............ [1]

(b) Another student took the test later.

What mark did this student get if

(i)   the median and range do not change,

Answer(b)(i) ...40............ [1]

(ii)   the median and range both increase by 1?

Answer(b)(ii) ...68............ [1]

7. These are the number of points *The Storm* have scored in their las 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.

```
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
```
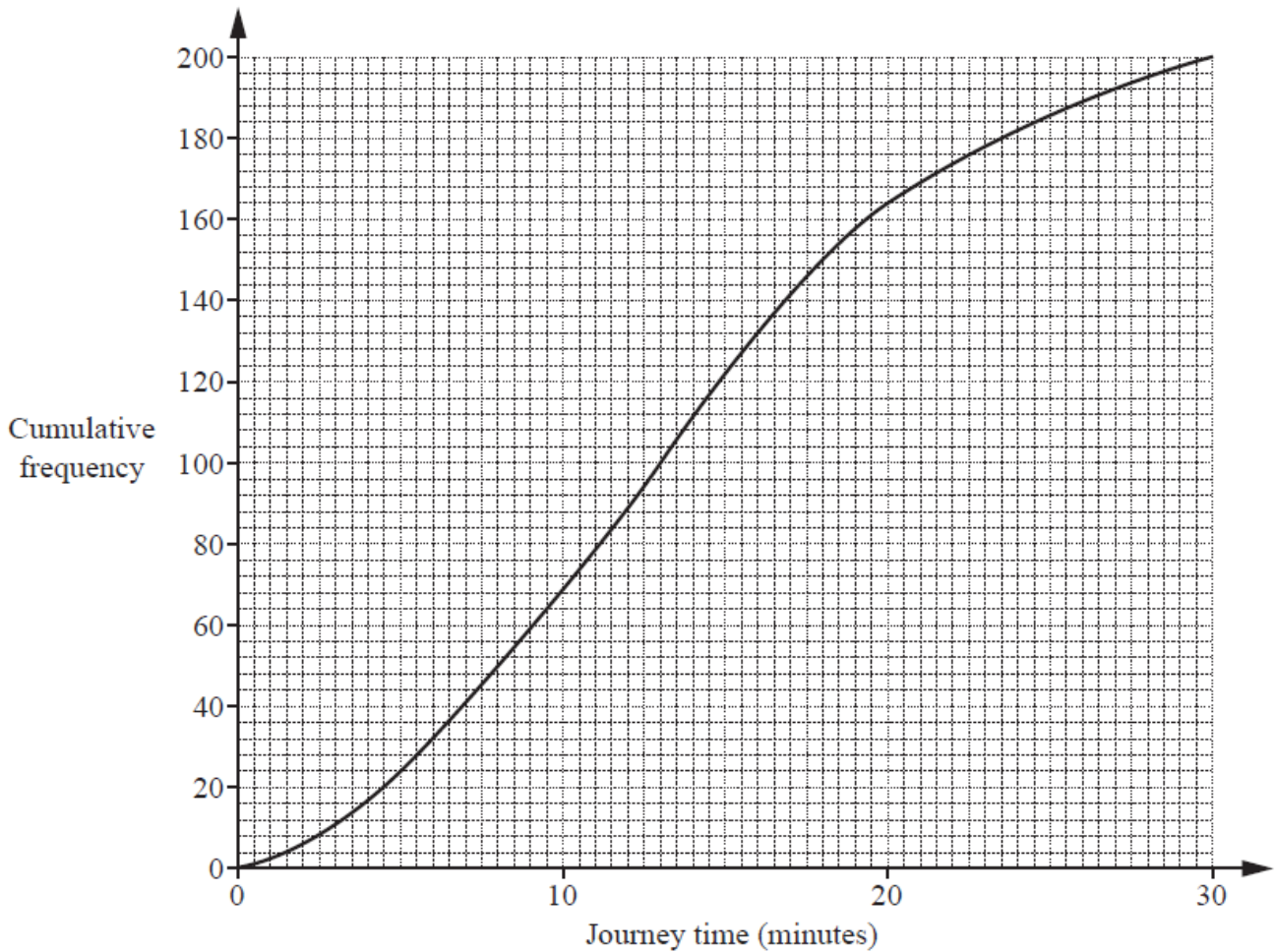
Key 5........ | 3........ = 53 [3]

(b) Find the median score

...........43............ [1]

8.

The cumulative frequency curve shows information about the journey times to school of 200 students.

(a) Find the median.

Answer(a) .... 13 .... min   [1]

(b) Find the number of students with a journey time of more than 20 minutes.

Answer(b) .... 36 ....   [2]

9. Jakob draws a scatter diagram which shows that two quantities, x and y, are correlated.
He calculates the equation of the regression line as $y = 32 - 1.5x$.

(a) What type of correlation is there between x and y?

.... Negative ....   [1]

(b) The mean of the y values is 14.

Find the mean of the x values.

.... 12 ....   [2]

10. The mean of a list of 9 numbers is 6.
When a 10th number is included in the list the mean is 5.5 .

Find the value of this 10th number.

..........1.............. [2]

11. The list shows the quiz scores of 13 students.

11   11   11   12   12   13   14   15   15   16   16   19   19

Find

(a) the mode,

.... 11 .... [1]

(b) the median,

.... 14 .... [1]

(c) the upper quartile.

.... 16 .... [1]

12. The table shows the numbers of pets owned by each of 100 families.

Number of pets	Frequency
0	23
1	37
2	25
3	10
4	5

(a) Write down the range.

.... 4 .... [1]

(b) Find the median.

.... 1 .... [1]

(c) Work out the mean.

.... 1.37 .... [2]

13.   16   10   11   15   10   12   14   13   17   10   15

Find the median of these eleven numbers.

.... 13 .... [1]

14.
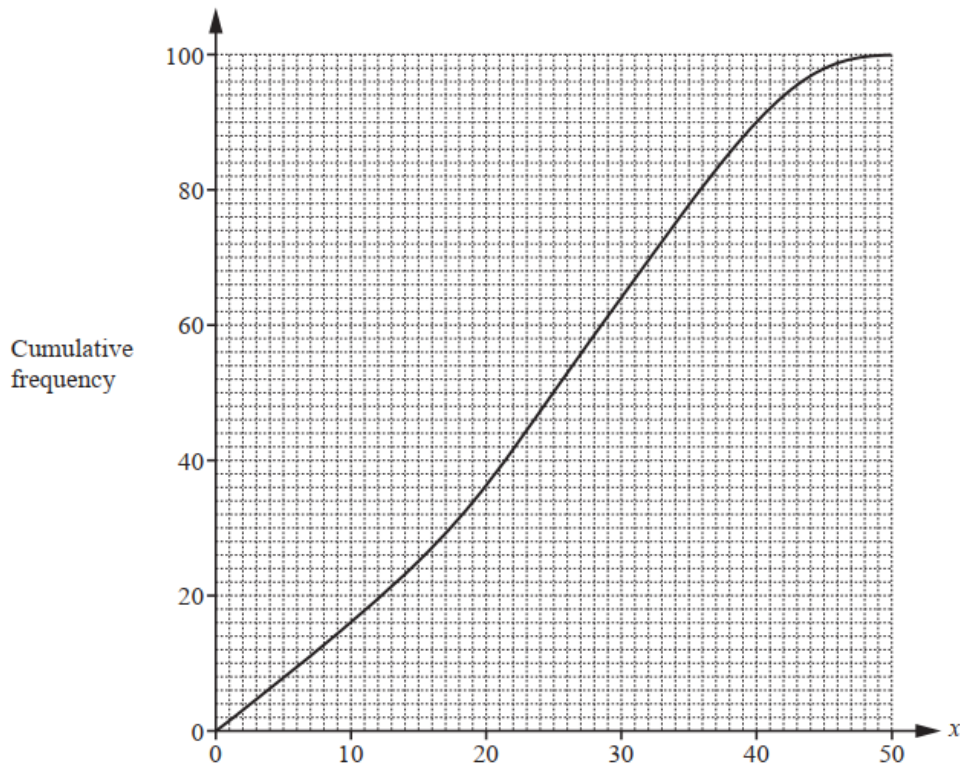
Use the cumulative frequency curve to estimate the inter-quartile range.

.... 19 .... [2]

15.
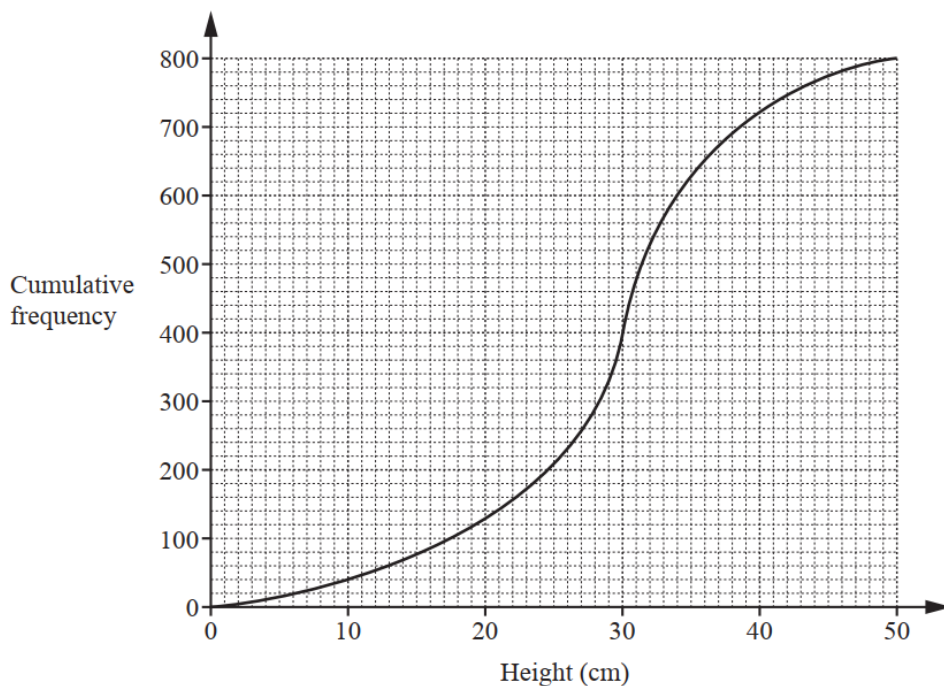
Height (cm)

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

(a) the median,

.... 30 .... cm [1]

(b) the upper quartile.

.... 34 .... cm [1]

16.
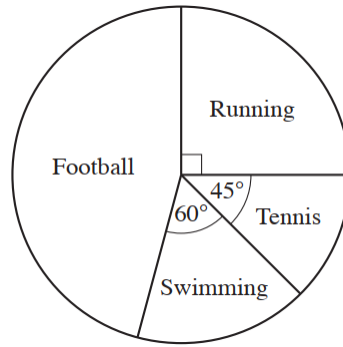
The pie chart shows the favourite sports of all the students at a school.
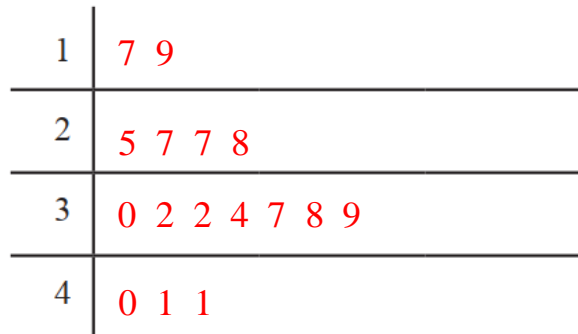180 students chose running as their favourite sport.

Work out

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

.... 720 .... [1]

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

.... 330 .... [2]

17. 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	7 9
2	5 7 7 8
3	0 2 2 4 7 8 9
4	0 1 1

Key: $3\,|\,2 = 3.2$

[2]

18. 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.

.... 72 .... cm [3]

19. 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.

....................................20.................................... [2]

20. This is a list of 8 numbers.

   11   7   8   13   7   14   15   5

(a) Find the median.

....................................9.5.................................... [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.
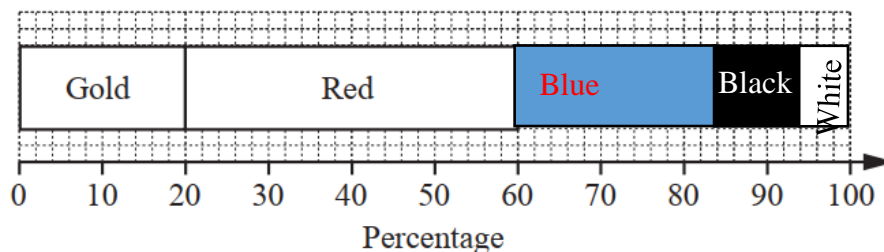
Find the ninth number.

....................19.................................... [3]

21. 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]

22. 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.

....................................30.................................... [2]

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

Find the 11th number.

....................................26.................................... [2]

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

Find the mean of the other two numbers.

....................................18.................................... [3]

25. 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.
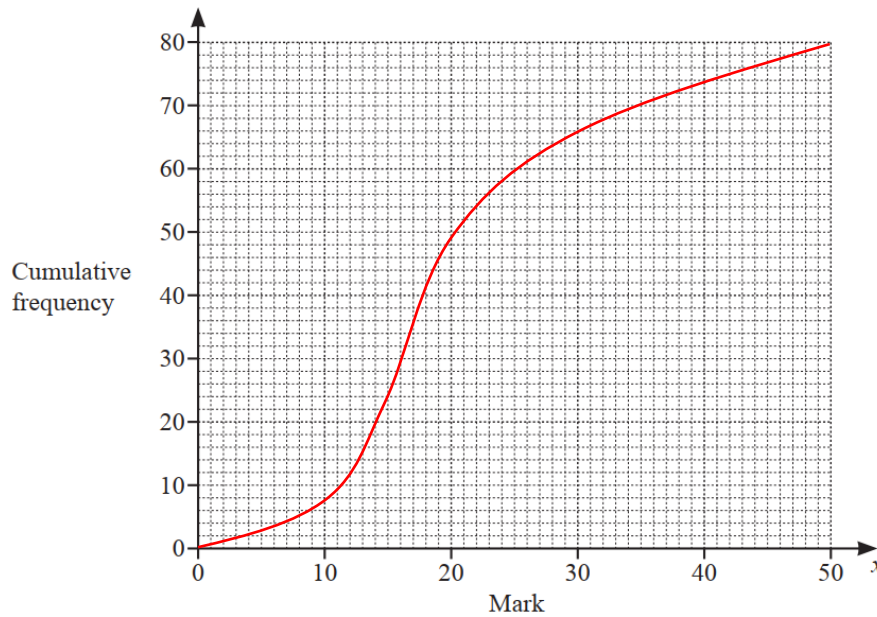
[4]

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

.... 17 to 19 .... [1]

26. 5 numbers have a mean of 12.
When a 6th number is included the mean is 9.

Work out the 6th number.

.... -6 .... [2]

27. These are the scores of 10 students in a test.

15   5   20   25   7   13   15   11   17   12

Find

(a) the range,

.... 20 .... [1]

(b) the mean.

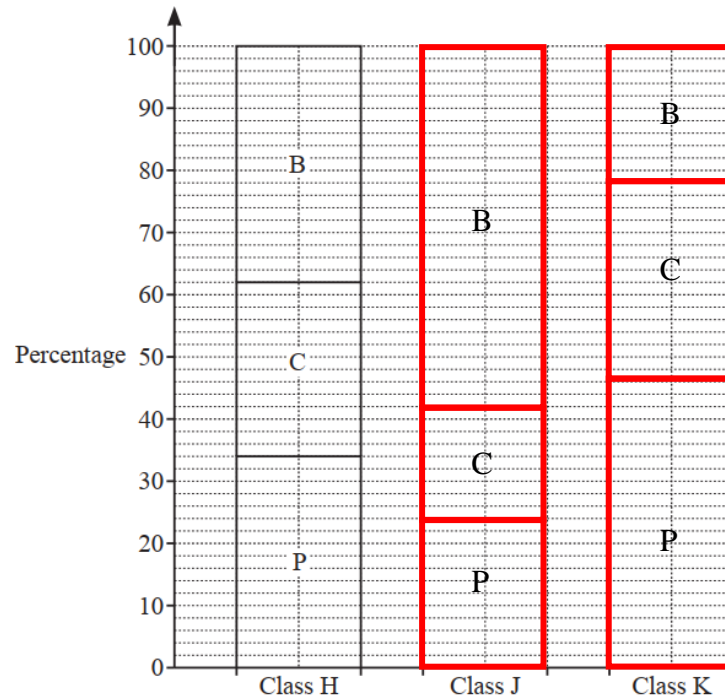............... 14 .... [2]

28. 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]

29. These are the scores of 10 students in a test.

      7   15   9   4   16   6   8   11   12   10

Find

(a) the median,

....................................9.5.................................... [2]

(b) the mean.

....................................9.8.................................... [2]