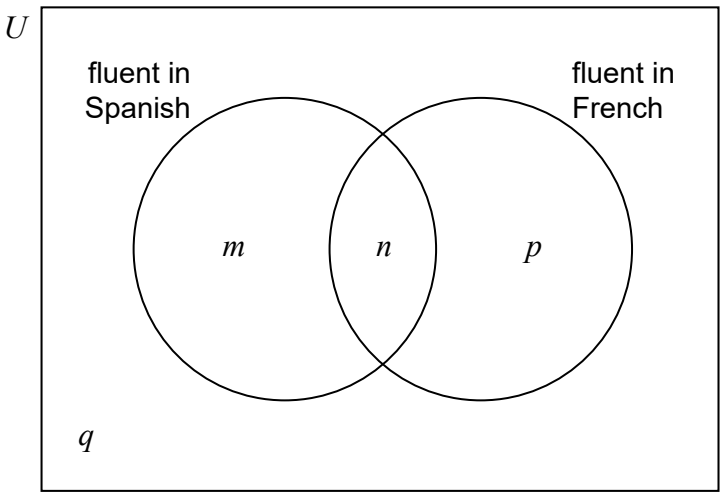
2. [Maximum mark: 6]

In a class of 30 students, 18 are fluent in Spanish, 10 are fluent in French, and 5 are not fluent in either of these languages. The following Venn diagram shows the events "fluent in Spanish" and "fluent in French".

The values m, n, p and q represent numbers of students.



(a) Write down the value of q. [1]

(b) Find the value of n. [2]

(c) Write down the value of m and of p. [3]

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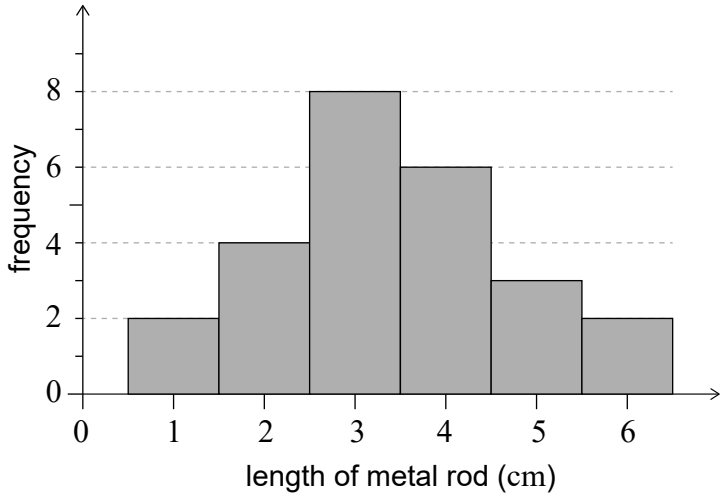
2. The histogram shows the lengths of 25 metal rods, each measured correct to the nearest cm.



(a) Write down the modal length of the rods. [1]

(b) Find the median length of the rods. [3]

The upper quartile is 4 cm.

(c) Calculate

(i) the lower quartile;

(ii) the interquartile range. [2]

Working:

Answers:

(a) . . . . . .

(b) . . . . . .

(c) (i) . . . . . .

(ii) . . . . . .

5. The table shows the first five terms of three sequences: u_n, v_n and w_n.

	n				
	1	**2**	**3**	**4**	**5**
u_n	10	20	40	80	160
v_n	10	20	30	60	100
w_n	10	20	30	40	50

(a) State which sequence is

(i) arithmetic;

(ii) geometric. [2]

(b) Find the exact value of the 11th term of the geometric sequence. [2]

(c) Find the sum of the first 20 terms of the arithmetic sequence. [2]

Working:

Answers:

(a) (i) . . . . . .

(ii) . . . . . .

(b) . . . . . .

(c) . . . . . .

7. Nick has $\$150\,000$ in a trust fund. Each year he donates 8% of the money remaining in his trust fund to charity.

(a) Determine the maximum number of years Nick can donate to charity while keeping at least $\$50\,000$ in the trust fund. [3]

Louise invests $\$200\,000$ in a bank account that pays a nominal interest rate of 5%, **compounded quarterly**, for eight years.

(b) Calculate the value of Louise's investment at the end of this time. Give your answer correct to the nearest cent. [3]

Working:

Answers:

(a) . . . . . .

(b) . . . . . .