8 The diagram shows an isosceles triangle.
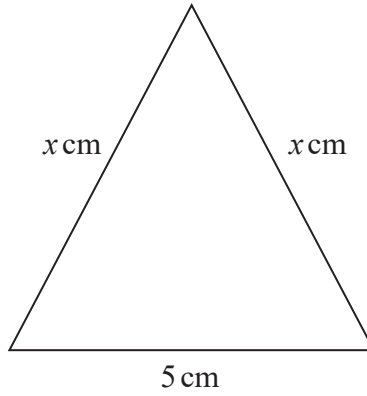

Diagram **NOT**
accurately drawn

x cm x cm

5 cm

The area of the triangle is 12 cm^2

Work out the perimeter of the triangle.
Give your answer correct to 3 significant figures.

cm

(Total for Question 8 is 4 marks)

9 The table shows information about the speeds of 60 cycles.

Speed (s km/h)	Frequency
$0 < s \leqslant 10$	3
$10 < s \leqslant 20$	16
$20 < s \leqslant 30$	24
$30 < s \leqslant 40$	10
$40 < s \leqslant 50$	5
$50 < s \leqslant 60$	2

(a) Complete the cumulative frequency table.

Speed (s km/h)	Cumulative frequency
$0 < s \leqslant 10$	
$0 < s \leqslant 20$	
$0 < s \leqslant 30$	
$0 < s \leqslant 40$	
$0 < s \leqslant 50$	
$0 < s \leqslant 60$	

(1)

(b) On the grid, draw a cumulative frequency graph for your table.

Cumulative frequency

Speed (km/h)
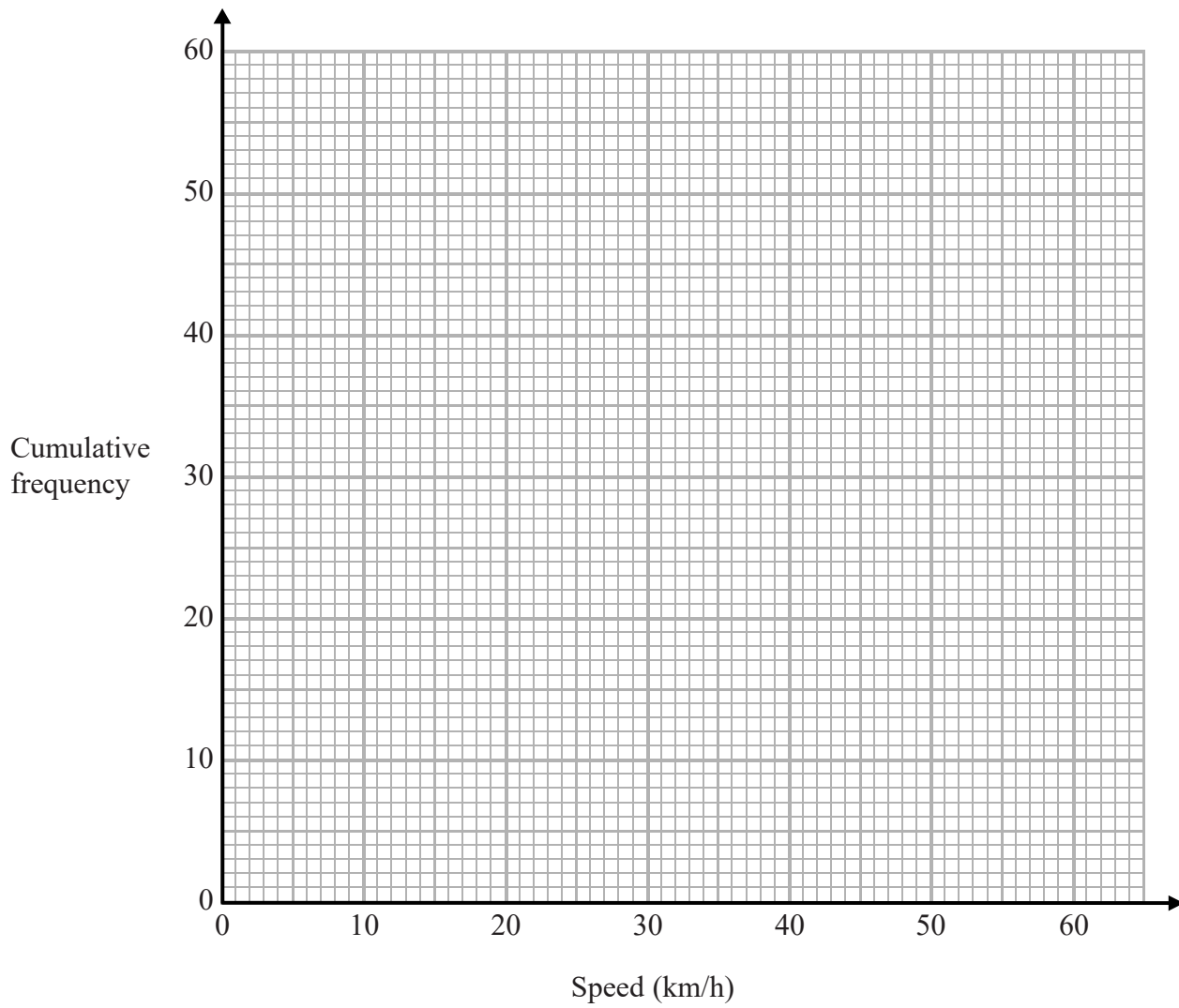
(2)

(c) Use your graph to find an estimate for the interquartile range of the speeds.

.... km/h

(2)

(Total for Question 9 is 5 marks)

10 Here is triangle *ABD*.
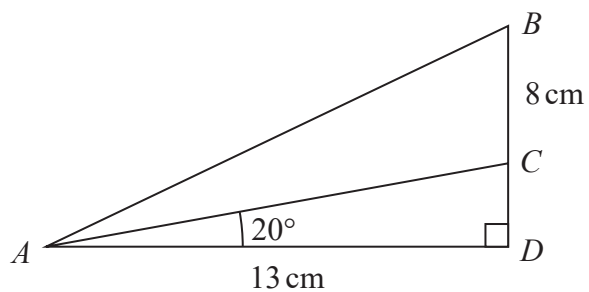

Diagram **NOT** accurately drawn

The point *C* lies on *BD*.

AD = 13 cm BC = 8 cm   angle ADB = 90°   angle CAD = 20°

Calculate the size of angle *BAC*.
Give your answer correct to 1 decimal place.

°

(Total for Question 10 is 5 marks)

11 Express $\dfrac{5}{3} - \dfrac{x+2}{2x}$ as a single fraction in its simplest terms.

(Total for Question 11 is 3 marks)

12 The curve C has equation $y = \dfrac{1}{3}x^3 - 9x + 1$

(a) Find $\dfrac{dy}{dx}$

$$\dfrac{dy}{dx} = $$

(2)

(b) Find the range of values of x for which C has a negative gradient.

(3)

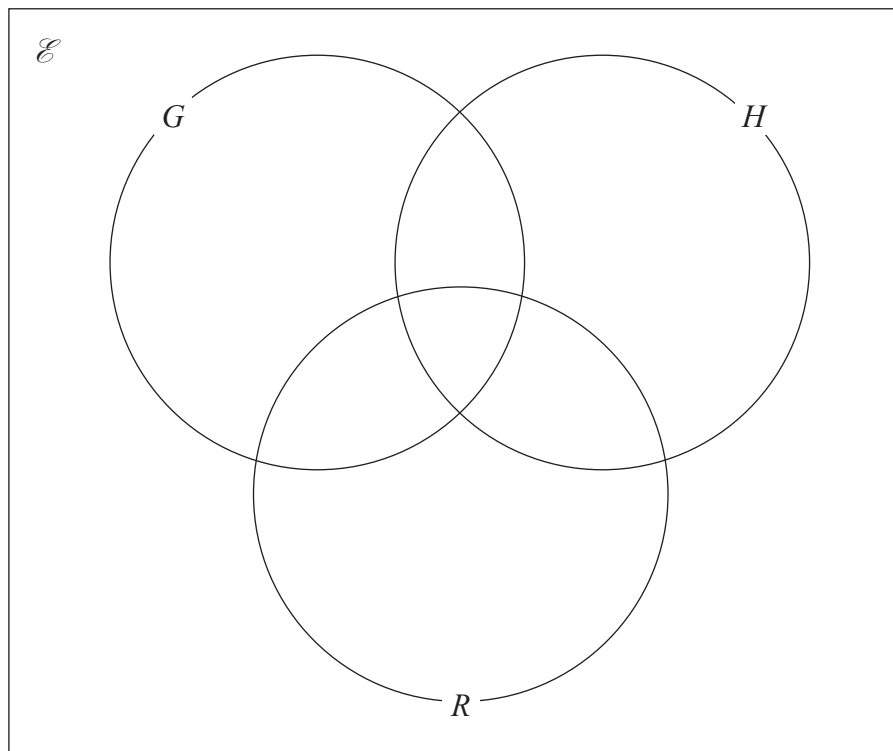**(Total for Question 12 is 5 marks)**

13 All the students in Year 11 at a school must study at least one of Geography (*G*), History (*H*) and Religious Studies (*R*).

In Year 11 there are 65 students.

Of these students

        15 study Geography, History and Religious Studies
        21 study Geography and History
        16 study Geography and Religious Studies
        30 study Geography
        18 study only Religious Studies
        37 study Religious Studies

(a) Using this information, complete the Venn diagram to show the number of students in each region of the Venn diagram.

(3)

A student in Year 11 who studies both History and Religious Studies is chosen at random.

(b) Work out the probability that this student does **not** study Geography.

(2)

(Total for Question 13 is 5 marks)

14 T is directly proportional to the cube of r

$T = 21.76$ when $r = 4$

(a) Find a formula for T in terms of r

(3)

(b) Work out the value of T when $r = 6$

(1)

(Total for Question 14 is 4 marks)