

11 The frequency table gives information about the ages of the 80 people in a train carriage.

Age (a years)	Frequency
$0 < a \leq 20$	9
$20 < a \leq 30$	19
$30 < a \leq 40$	17
$40 < a \leq 50$	18
$50 < a \leq 60$	13
$60 < a \leq 70$	4

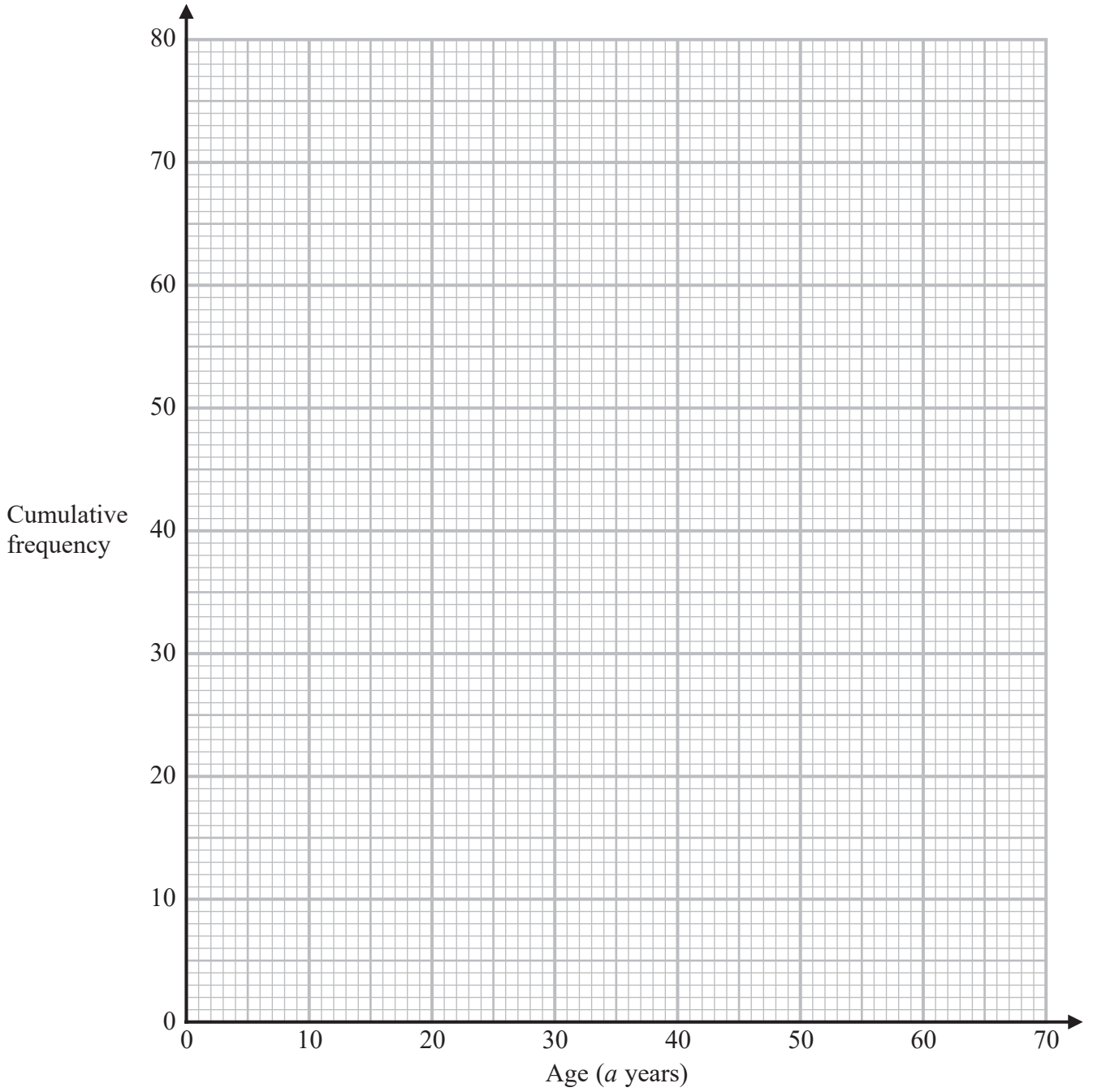
(a) Complete the cumulative frequency table.

Age (a years)	Cumulative frequency
$0 < a \leq 20$	
$0 < a \leq 30$	
$0 < a \leq 40$	
$0 < a \leq 50$	
$0 < a \leq 60$	
$0 < a \leq 70$	

(1)



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



(2)

(c) Use your graph to find an estimate for the median age of the people in the train carriage.

..... years

(2)

(Total for Question 11 is 5 marks)

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12 Solve the simultaneous equations

$$7x + 2y = 5.5$$

$$3x - 5y = 17$$

Show clear algebraic working.

$x =$

$y =$

(Total for Question 12 is 4 marks)

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13 The curve C has equation $y = 5x^3 - x^2 - 6x + 4$

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

$$\frac{dy}{dx} = \dots\dots\dots$$

(2)

There are two points on the curve C at which the gradient of the curve is 2

(b) Find the x coordinate of each of these two points.
Show clear algebraic working.

.....
(4)

(Total for Question 13 is 6 marks)



14 Expand and simplify $(4x + 1)(x - 3)(5x + 6)$

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(Total for Question 14 is 3 marks)



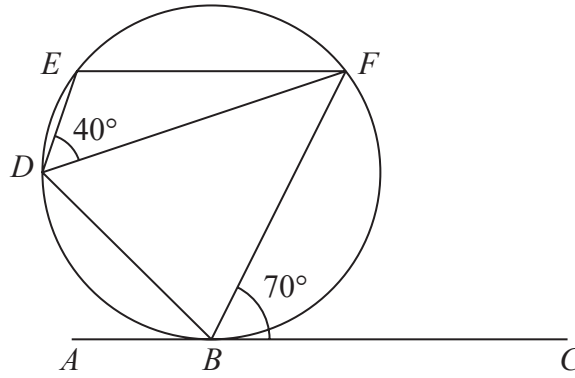


Diagram **NOT**
accurately drawn

B , D , E and F are points on a circle.
 ABC is the tangent to the circle at B .

Angle $EDF = 40^\circ$

Angle $FBC = 70^\circ$

Prove that the tangent ABC is parallel to EF .
Give a reason for each stage of your working.

(Total for Question 15 is 4 marks)



16 The functions f and g are defined as

$$f: x \mapsto 5x - 7$$

$$g: x \mapsto \frac{5x}{x + 4}$$

(a) Write down the value of x that must be excluded from any domain of g

.....
(1)

(b) Find $gf(2.6)$

.....
(2)

(c) Solve $fg(x) = 2$

$x =$
(3)

(d) Express the inverse function g^{-1} in the form $g^{-1}: x \mapsto \dots$

$g^{-1}: x \mapsto$
(3)

(Total for Question 16 is 9 marks)



17 The diagram shows a prism $ABCDEFGH$ with a horizontal base.

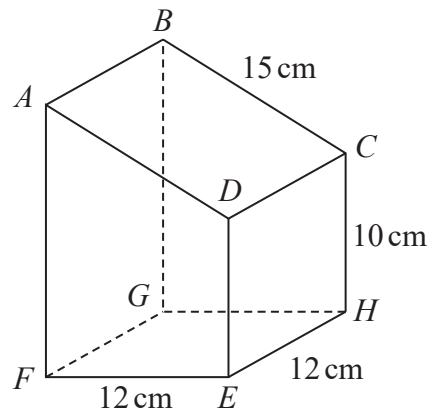


Diagram **NOT** accurately drawn

The base of the prism, $EFGH$, is a square of side 12 cm.

Trapezium $ADEF$ is a cross section of the prism where AF and DE are vertical edges.

$$DE = CH = 10 \text{ cm}$$

$$AD = BC = 15 \text{ cm}$$

- (a) Work out the size of the angle between CF and the base $EFGH$.
Give your answer correct to one decimal place.

.....
(3)

- (b) Work out the length of BE .
Give your answer correct to one decimal place.

..... cm
(3)

(Total for Question 17 is 6 marks)

