



1 Write down a prime number between 20 and 30.

..... [1]

2 Write 0.0000387 in standard form.

..... [1]

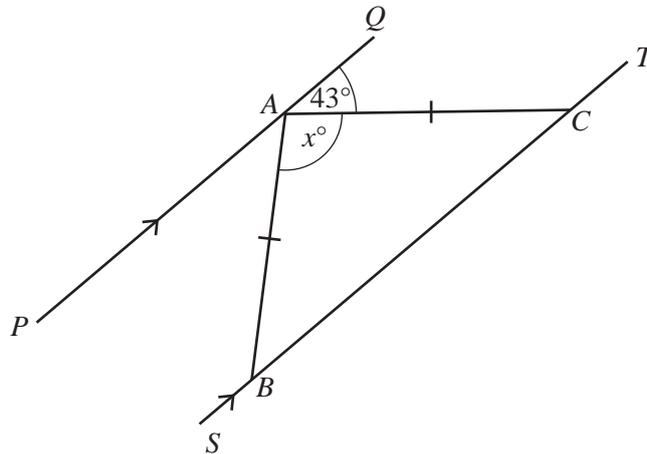
3 Write the recurring decimal  $0.\dot{6}\dot{3}$  as a fraction.

..... [1]

4 Find the value of  $7x + 3y$  when  $x = 12$  and  $y = -6$ .

..... [2]

5



NOT TO SCALE

The diagram shows two parallel lines  $PAQ$  and  $SBCT$ .  
 $AB = AC$  and angle  $QAC = 43^\circ$ .

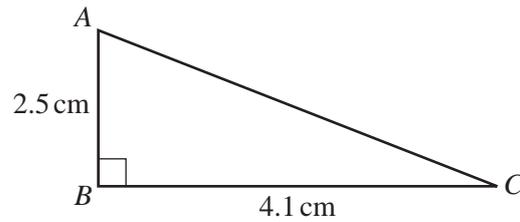
Find the value of  $x$ .

$x =$  ..... [2]

- 6 Calculate the area of a circle with radius 5.1 cm.

.....cm<sup>2</sup> [2]

7



NOT TO  
SCALE

Calculate the length of  $AC$ .

$AC =$  ..... cm [2]

- 8 Expand and simplify.

$$6(2y - 3) - 5(y + 1)$$

..... [2]

9  $3^{-q} \times \frac{1}{27} = 81$

Find the value of  $q$ .

$q =$  ..... [2]

10 (a) Calculate  $\sqrt{2.38 + 6.4^2}$ , writing down your full calculator display.

..... [1]

(b) Write your answer to **part (a)** correct to 4 decimal places.

..... [1]

11 Find the exact value of  $8^{\frac{2}{3}} \times 49^{-\frac{1}{2}}$ .

..... [2]

12 Solve the inequality.

$$3n - 5 > 17 + 8n$$

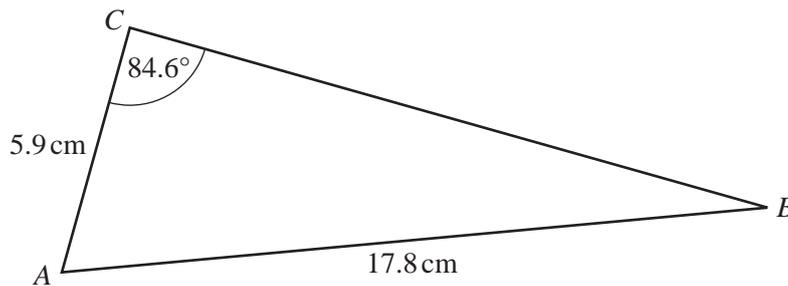
..... [2]

- 13 Without using your calculator, work out  $1\frac{3}{4} \times \frac{6}{35}$ .

You must show all your working and give your answer as a fraction in its simplest form.

..... [3]

14



NOT TO  
SCALE

Use the sine rule to find angle  $ABC$ .

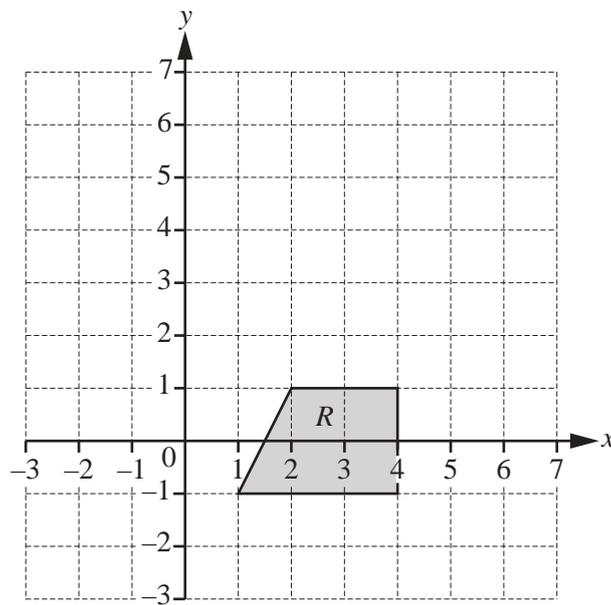
Angle  $ABC =$  ..... [3]

- 15  $y$  is directly proportional to  $(x - 1)^2$ .  
When  $x = 5$ ,  $y = 4$ .

Find  $y$  when  $x = 7$ .

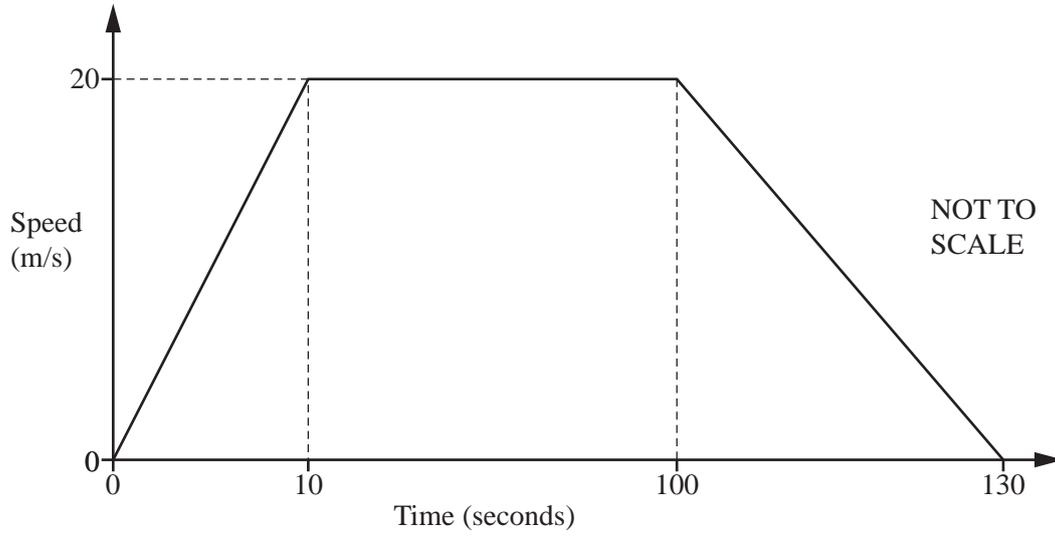
$y = \dots\dots\dots$  [3]

- 16



On the grid, draw the image of shape  $R$  after the transformation represented by the matrix  $\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$ . [3]

17



The speed–time graph shows information about the journey of a tram between two stations.

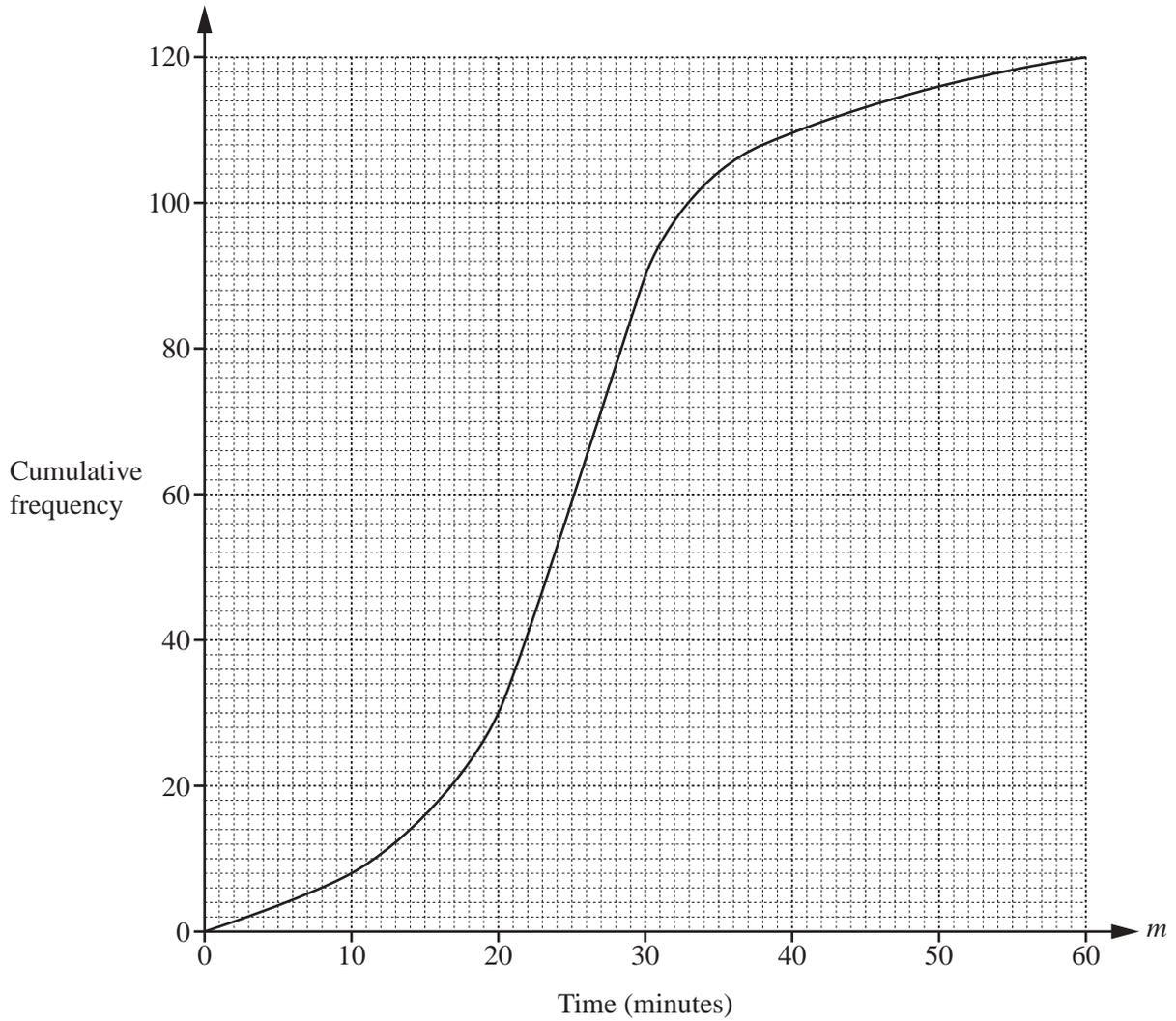
(a) Calculate the distance between the two stations.

..... m [3]

(b) Calculate the average speed of the tram for the whole journey.

..... m/s [1]

- 18 The cumulative frequency diagram shows information about the time,  $m$  minutes, taken by 120 students to complete some homework.



Use the cumulative frequency diagram to find an estimate of

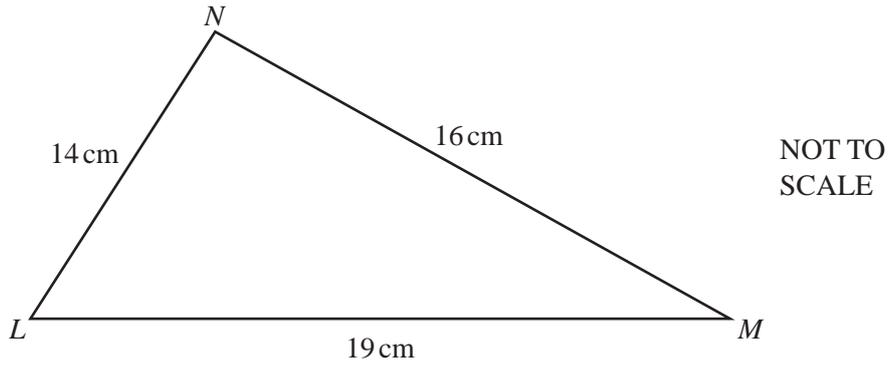
- (a) the interquartile range,

..... min [2]

- (b) the number of students who took more than 50 minutes to complete the homework.

..... [2]

19



Calculate angle  $LMN$ .

Angle  $LMN = \dots\dots\dots$  [4]

- 20 (a) A box contains 3 blue pens, 4 red pens and 8 green pens only.  
A pen is chosen at random from the box.

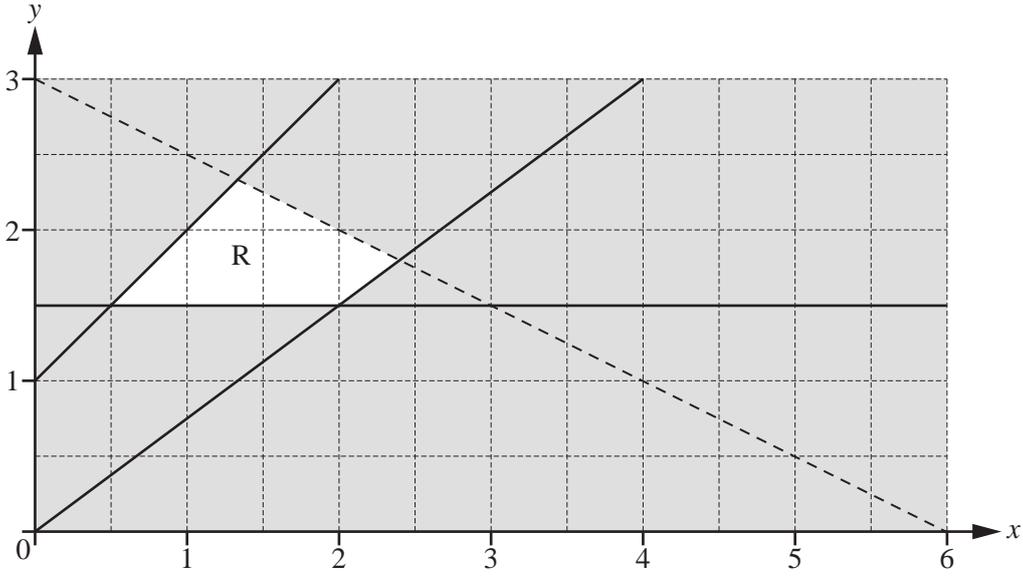
Find the probability that this pen is green.

$\dots\dots\dots$  [1]

- (b) Another box contains 7 black pens and 8 orange pens only.  
Two pens are chosen at random from this box without replacement.

Calculate the probability that at least one orange pen is chosen.

$\dots\dots\dots$  [3]



There are four inequalities that define the region R.  
 One of these is  $y \leq x + 1$ .

Find the other three inequalities.

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

22  $f(x) = 5 - 2x$   $g(x) = x^2 + 8$

(a) Calculate  $ff(-3)$ .

..... [2]

(b) Find

(i)  $g(2x)$ ,

..... [1]

(ii)  $f^{-1}(x)$ .

$f^{-1}(x) =$  ..... [2]

23 40 people were asked how many times they visited the cinema in one month.  
The table shows the results.

Number of cinema visits	0	1	2	3	4	5	6	7
Frequency	5	5	6	6	7	3	6	2

(a) (i) Find the mode.

..... [1]

(ii) Calculate the mean.

..... [3]

(b) Omar wants to show the information from the table in a pie chart.

Calculate the sector angle for the people who visited the cinema 5 times.

..... [2]

**Question 24 is printed on the next page.**

- 24 (a) Point  $A$  has co-ordinates  $(1, 0)$  and point  $B$  has co-ordinates  $(2, 5)$ .

Calculate the angle between the line  $AB$  and the  $x$ -axis.

..... [3]

- (b) The line  $PQ$  has equation  $y = 3x - 8$  and point  $P$  has co-ordinates  $(6, 10)$ .

Find the equation of the line that passes through  $P$  and is perpendicular to  $PQ$ .  
Give your answer in the form  $y = mx + c$ .

$y =$  ..... [3]

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