



|  |
|--|
|  |
|--|

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|--|--|--|--|--|

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|

## 0580/21

May/June 2018

**1 hour 30 minutes**

Additional Materials:      Electronic calculator                      Geometrical instruments  
                                 Tracing paper (optional)

**READ THESE INSTRUCTIONS FIRST**

DO **NOT** WRITE IN ANY BARCODES.

For  $\pi$ , use either your calculator value or 3.142.

The total of the marks for this paper is 70.

This document consists of **12** printed pages.

- 1 Write down a prime number between 20 and 30.

..... [1]

- 2 Write 0.000 038 7 in standard form.

..... [1]

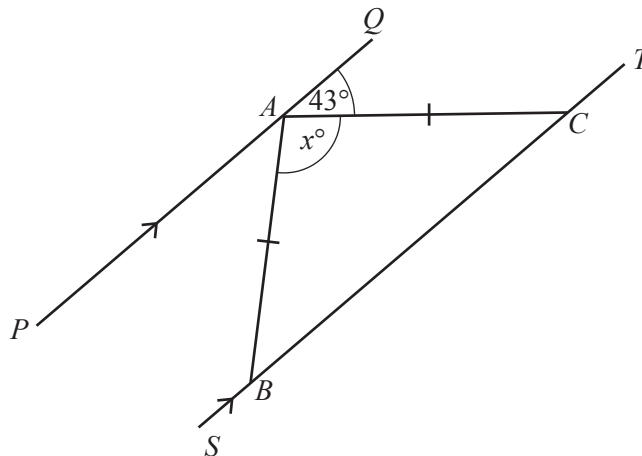
- 3 Write the recurring decimal  $0.\dot{6}\dot{3}$  as a fraction.

..... [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  $QAC = 43^\circ$ .

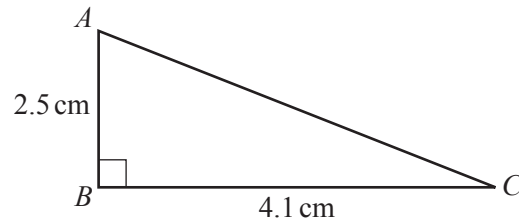
Find the value of  $x$ .

$x =$  ..... [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.

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

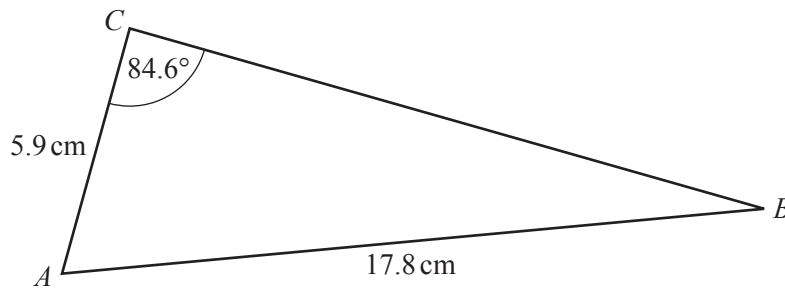
..... [2]

- 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  $ABC$ .

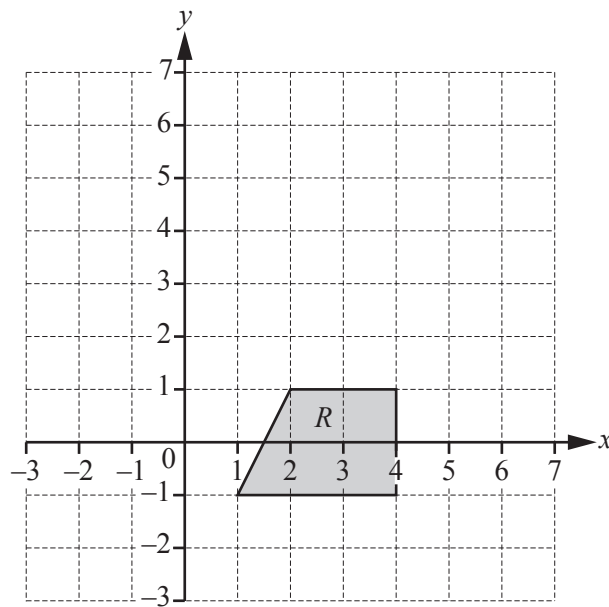
Angle  $ABC =$  ..... [3]

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

Find  $y$  when  $x = 7$ .

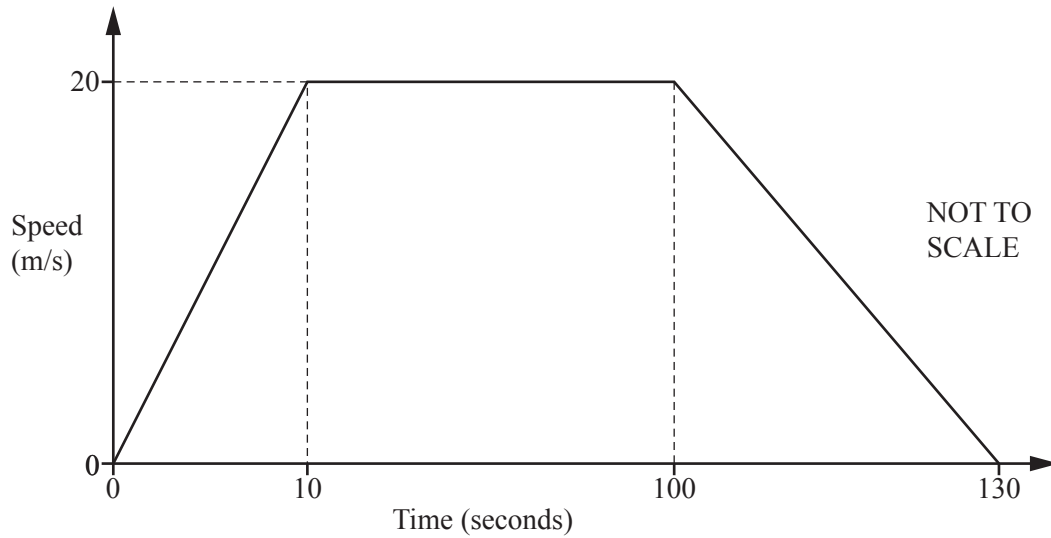
$y = \dots\dots\dots$  [3]

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.

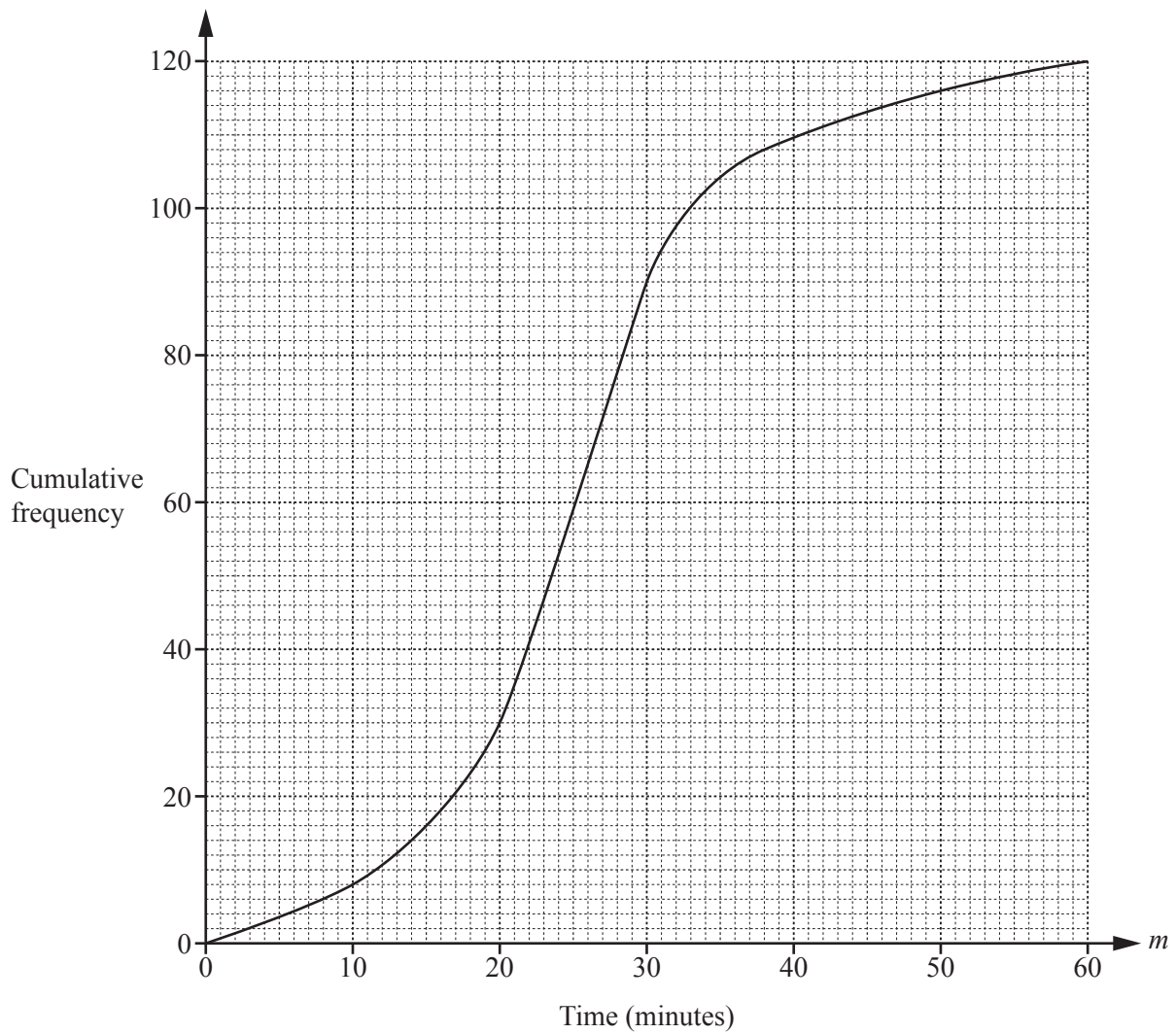
**(a)** Calculate the distance between the two stations.

..... 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

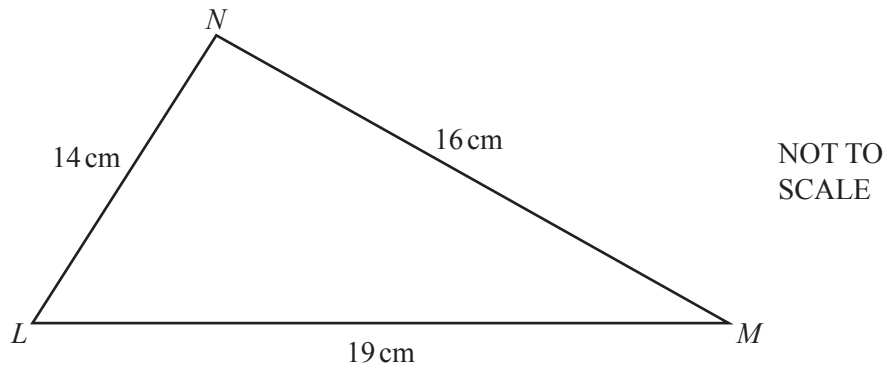
- (a) the interquartile range,

..... 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.

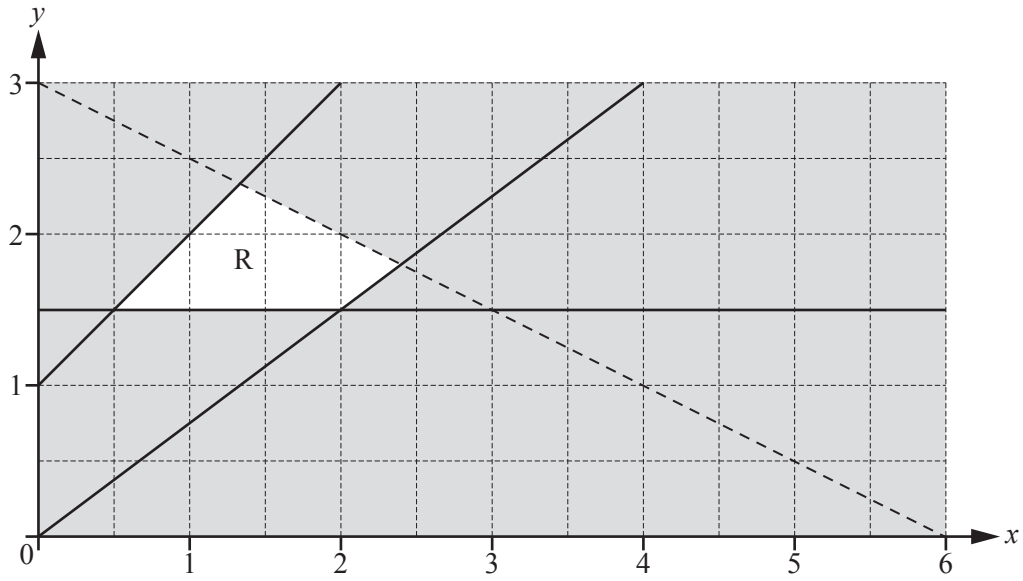
$\dots\dots\dots$  [1]

- (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]

21



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]

---

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at [www.cie.org.uk](http://www.cie.org.uk) after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.