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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 π , 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]

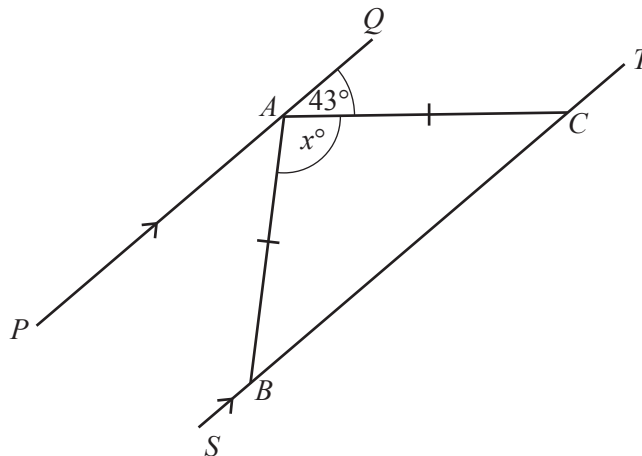
- 3 Write the recurring decimal $0.\dot{6}\dot{3}$ as a fraction.

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

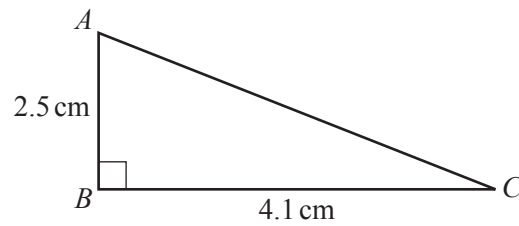
Find the value of x .

$x =$ [2]

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

.....cm² [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.

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

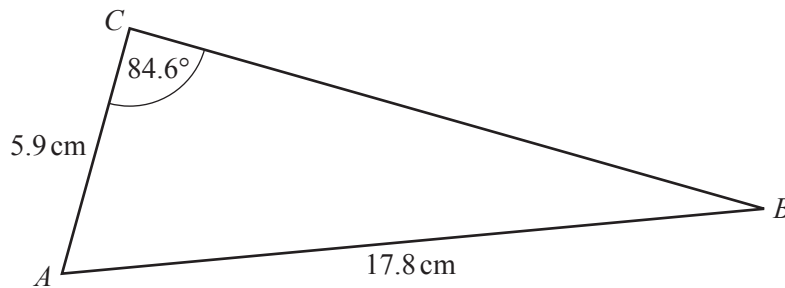
..... [2]

- 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 .

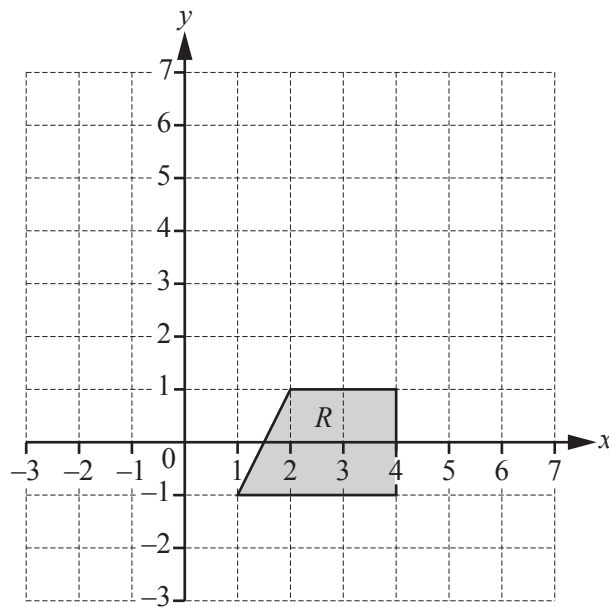
Angle $ABC =$ [3]

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

Find y when $x = 7$.

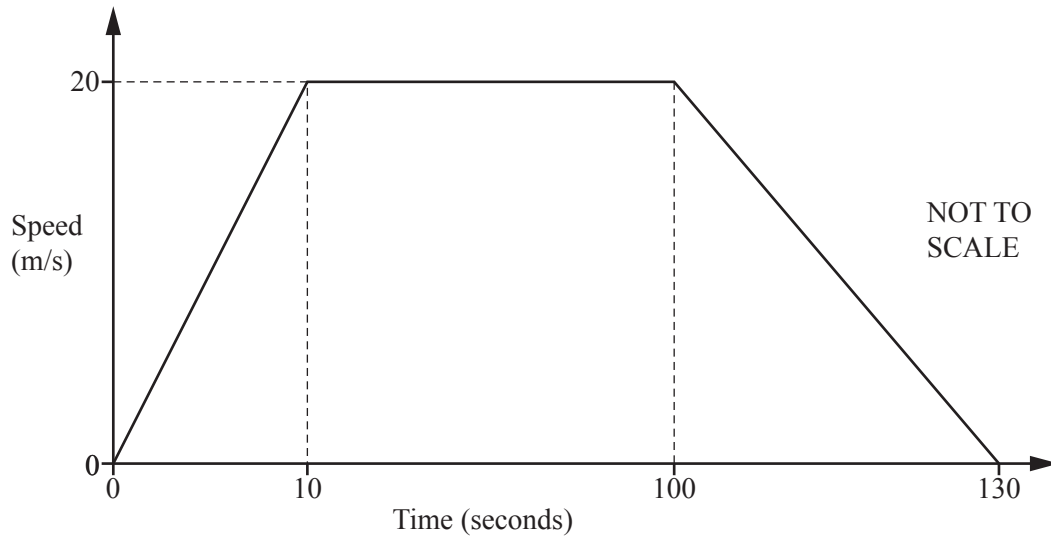
$y = \dots\dots\dots$ [3]

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.

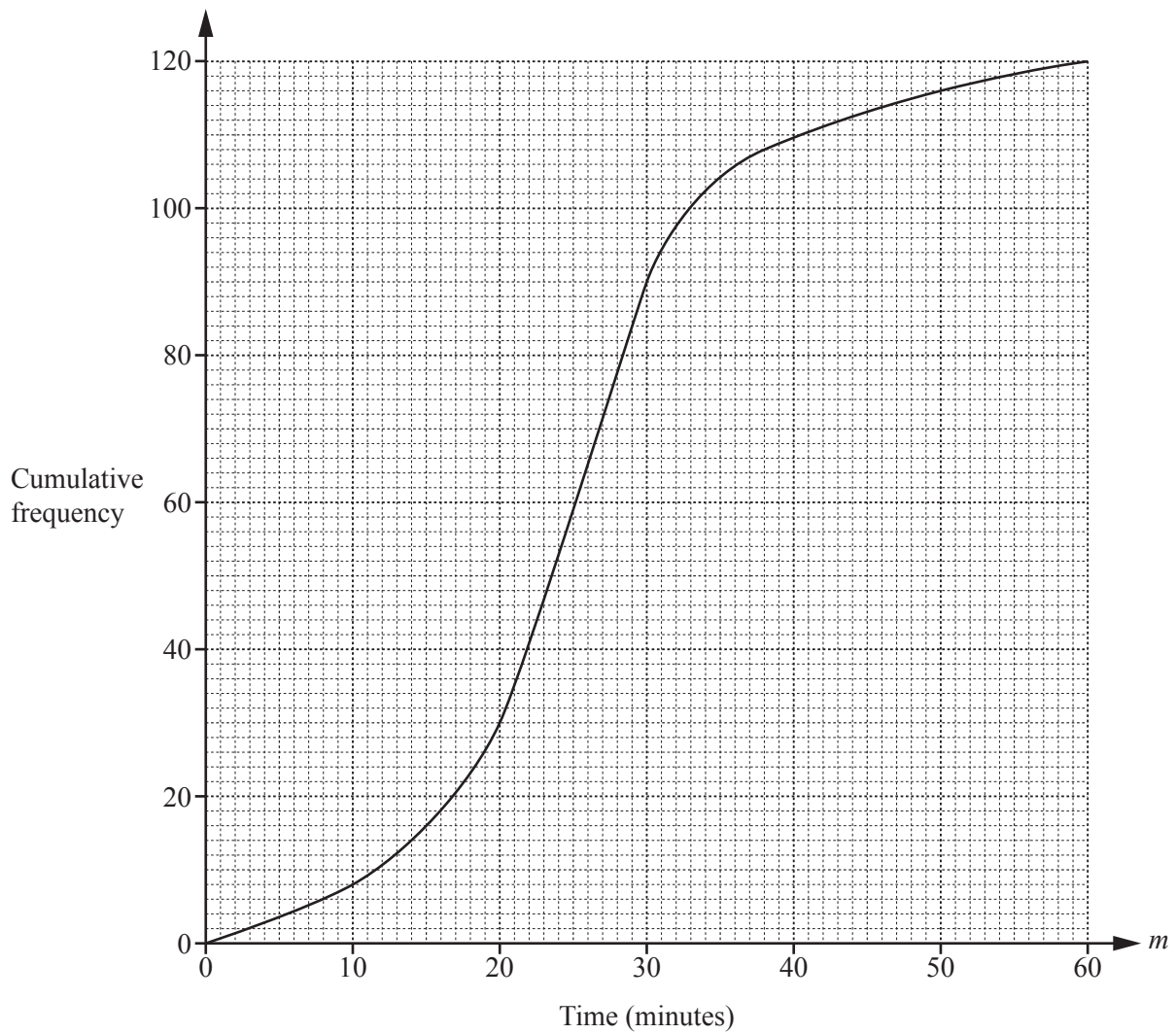
- (a) Calculate the distance between the two stations.

..... 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

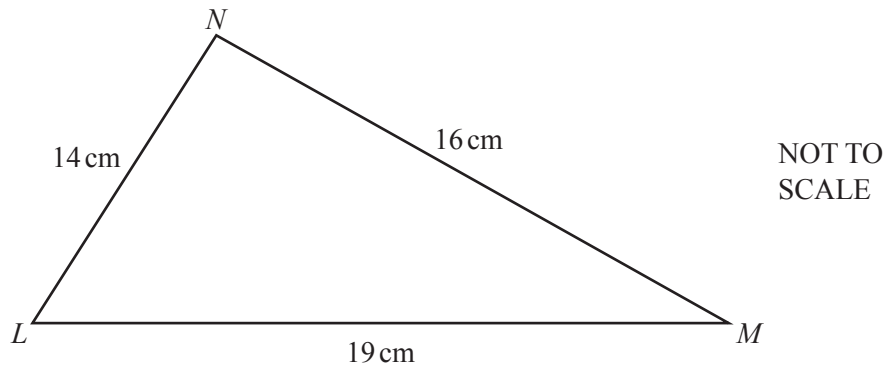
- (a) the interquartile range,

..... 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.

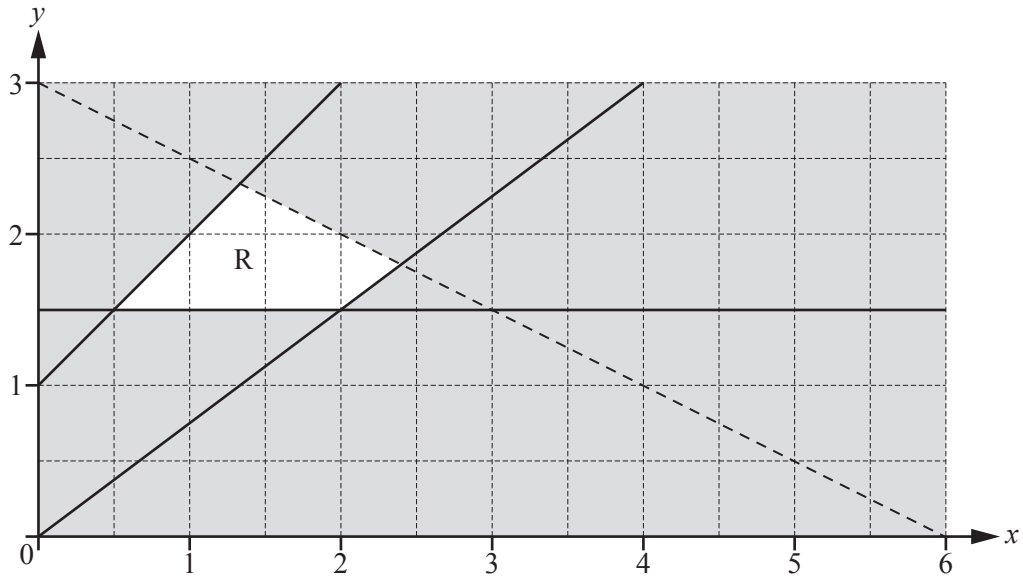
$\dots\dots\dots$ [1]

- (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]

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