Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

9993999299

MATHEMATICS **0580/23**

Paper 2 (Extended) **May/June 2021**

1 hour 30 minutes

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π, use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 70.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages.

1 Write down the number that is 23 less than -1.6 .

..... [1]

2 Write as a fraction in its simplest form.

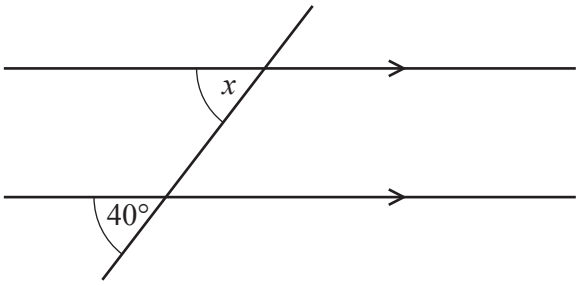
(a) 72%

..... [1]

(b) 0.004

..... [1]

3



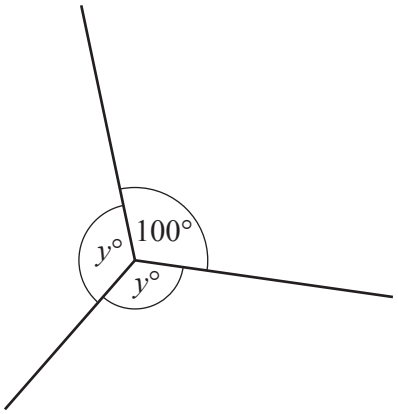
NOT TO SCALE

The diagram shows a pair of parallel lines and a straight line.

Complete the statement with the correct geometrical reason.

$x = 40°$ because the angles are ..... [1]

4



NOT TO SCALE

Find the value of y.

$y =$ ..... [2]

5 Jo invests \$600 for 7 years at a rate of 1.5% per year simple interest.

Calculate the total interest earned during the 7 years.

\$ ..... [2]

6 Maria buys n pencils that cost p cents each.
She pays with a \$$y$ note.

Find, in terms of n, p and y, the amount of change Maria receives.
Give your answer in cents.

..... cents [2]

7 12 18 29 49 91 125

From the list of numbers, write down

(a) a cube number,

..... [1]

(b) a prime number.

..... [1]

8 Alex changes 190 euros (€) into pounds (£) when £1 = €1.1723 .

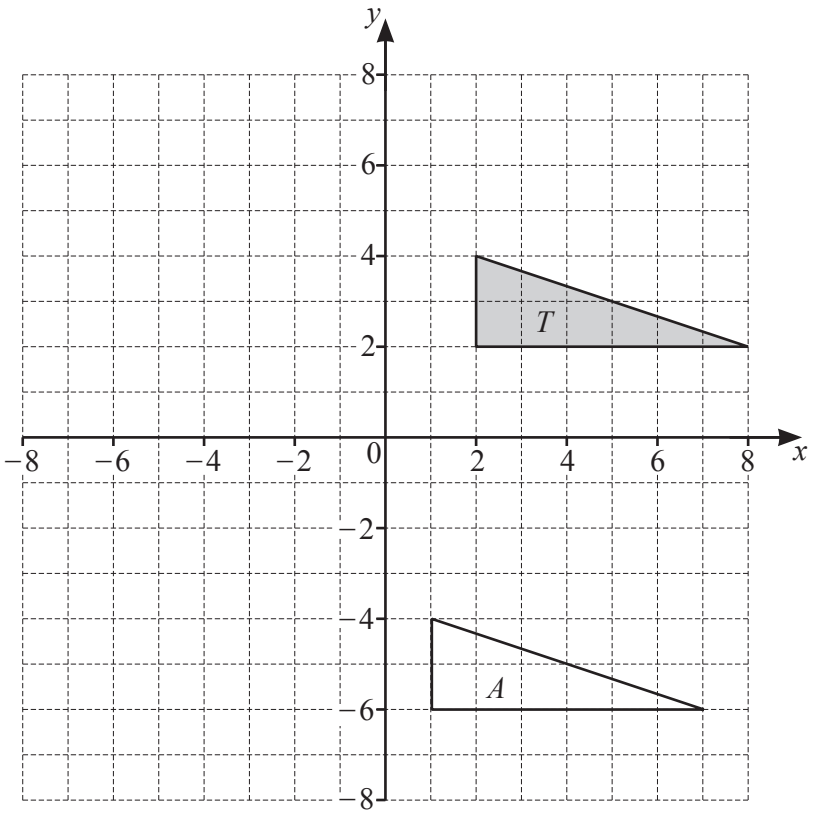
Calculate the amount Alex receives.
Give your answer correct to 2 decimal places.

£ ..... [2]

9 **Without using a calculator**, work out $1\frac{2}{3} \div 7\frac{1}{2}$.
You must show all your working and give your answer as a fraction in its simplest form.

..... [3]

10



(a) Describe fully the **single** transformation that maps triangle T onto triangle A.

.....

..... [2]

(b) Draw the image of triangle T after an enlargement, scale factor $-\frac{1}{2}$, centre (0, 0). [2]

11 Simplify $3x^3 \times 4x^4$.

..... [2]

12 x is an integer and $-3 \leqslant 2x-1 < 3$.

Find the values of x.

..... [2]

13 Expand and simplify.

$$6(t-q)-2(t-3q)$$

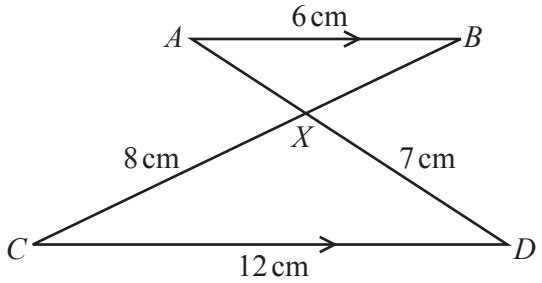
..... [2]

14 The magnitude of the vector $\begin{pmatrix} 20 \\ k \end{pmatrix}$ is 29.

Find the value of k.

$k =$ ..... [3]

15



NOT TO SCALE

In the diagram, AB is parallel to CD.
AD and BC intersect at X.
$AB = 6\,\text{cm}$, $CD = 12\,\text{cm}$, $CX = 8\,\text{cm}$ and $DX = 7\,\text{cm}$.

(a) Complete the statement.

Triangle ABX is ..... to triangle DCX. [1]

(b) Work out the length of BX.

$BX =$ ..... cm [2]

(c) The area of triangle DCX is $26.906\,\text{cm}^2$.

Use this value to find the area of

(i) triangle ABX,

..... cm^2 [2]

(ii) triangle ACX.

..... cm^2 [1]

16 The sides of a regular hexagon are 80 mm, correct to the nearest millimetre.

Calculate the lower bound of the perimeter of the hexagon.

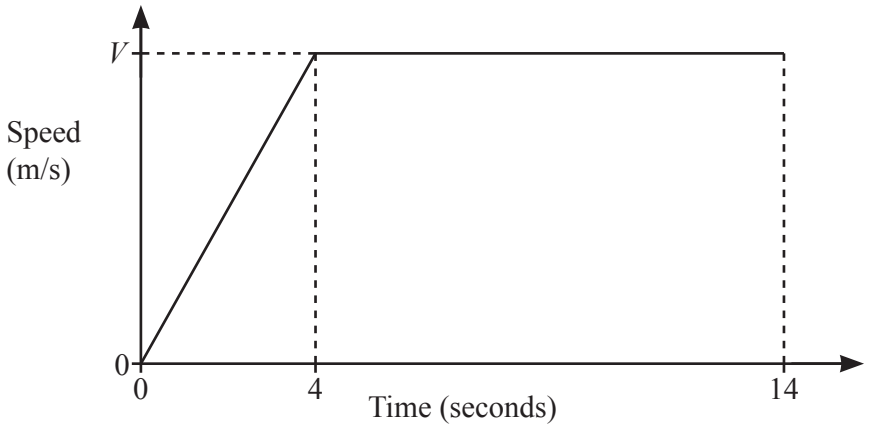
..... mm [2]

17 The interior angle of a regular polygon is 175°.

Calculate the number of sides.

..... [2]

18 A car starts from rest and accelerates at a rate of 3 m/s^2 for 4 seconds.
The car then travels at a constant speed for 10 seconds.



NOT TO SCALE

The diagram shows the speed–time graph for this journey.

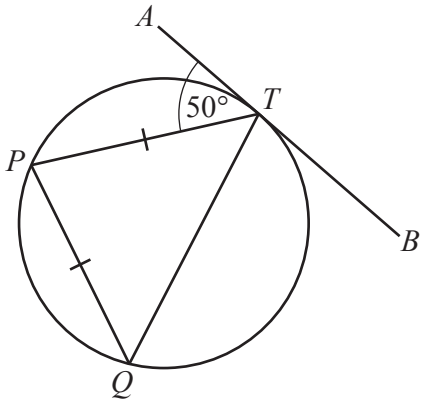
(a) Find the value of V.

$V =$ ..... [1]

(b) Calculate the total distance travelled by the car during the 14 seconds.

..... m [2]

19 (a)



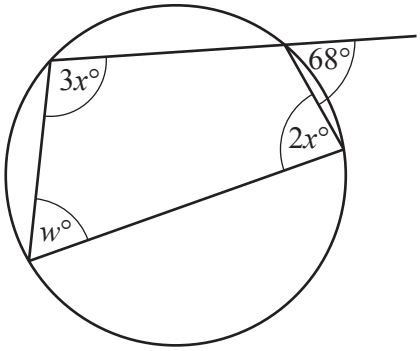
NOT TO SCALE

P, Q and T are points on a circle.
ATB is a tangent to the circle at T and $PT = PQ$.

Find angle TPQ.

Angle TPQ = ... [2]

(b)



NOT TO SCALE

The diagram shows a cyclic quadrilateral with an exterior angle of 68°.

Find the value of w and the value of x.

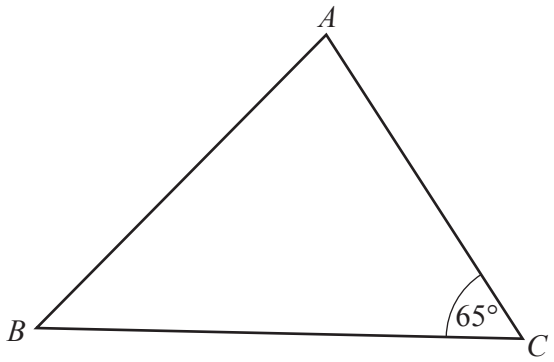
w = ...

x = ... [3]

20 Simplify $2.1 \times 10^{p} + 2.1 \times 10^{p-1}$.
Give your answer in standard form.

..... [2]

21



NOT TO SCALE

The shortest distance from B to AC is 12.8 cm.

Calculate BC.

$BC =$ ..... cm [3]

22 z is inversely proportional to the square of $(y-2)$.
When $y = 5$, $z = 9$.

Find z in terms of y.

$z =$ ..... [2]

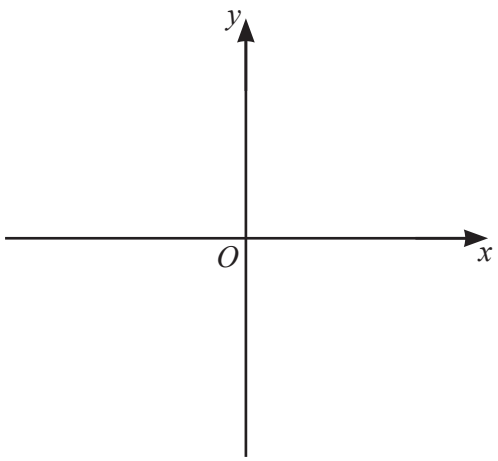
23 A triangle has sides of length 11 cm, 10 cm and 9 cm.

Calculate the largest angle in the triangle.

..... [4]

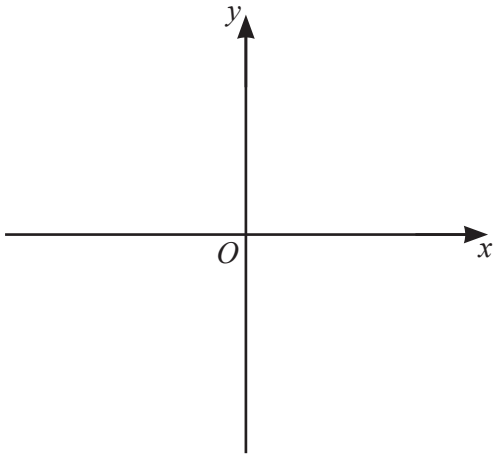
24 On the axes, sketch the graph of each of these functions.

(a) $y = \frac{2}{x}$



[2]

(b) $y = 2^{-x}$



[2]

Questions 25 and 26 are printed on the next page.

25 Find the x-coordinates of the points on the graph of $y = x^5 - 5x^4$ where the gradient is 0.

..... [4]

26 Malik goes to a shop every day to buy bread.

On any day, the probability that Malik goes to the shop in the morning is 0.7 .

If he goes in the morning, the probability that there is bread for Malik to buy is 0.95 .
If he goes later, the probability that there is bread for Malik to buy is 0.6 .

Calculate the probability that, on any day, there is bread for Malik to buy.

..... [3]