

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

I declare this is my own work.

INTERNATIONAL GCSE MATHEMATICS EXTENSION

Paper 2E

E

Wednesday 18 November 2020

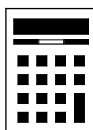
07:00 GMT

Time allowed: 2 hours

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 100.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.
- If your calculator does not have a π button, take the value of π to be 3.142

Advice

- Show all necessary working; otherwise marks for method may be lost.

For Examiner's Use

Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
26–27	
28–29	
TOTAL	



N 0 V 2 0 9 2 6 0 2 E 0 1

1B/M/Nov20/E8

9260/2E

Answer **all** questions in the spaces provided.

- 1** Circle the lowest common multiple of 6, 12 and 18

[1 mark]

6

18

36

72

- 2** The first four terms of a linear sequence are

12 7 2 -3

Circle the expression for the n th term.

[1 mark]

$5n + 12$

$n - 5$

$5n + 7$

$17 - 5n$

- 3** Circle the calculation that **decreases** 320 by two fifths.

[1 mark]

$320 \div \frac{2}{5}$

$320 \times \frac{2}{5}$

$320 \times \frac{3}{5}$

$320 \div \frac{3}{5}$



- 4** Circle the pair of values of x for which $(x + 1)(3x - 2) = 0$

[1 mark]

$$-1 \text{ and } \frac{2}{3}$$

$$-1 \text{ and } -\frac{3}{2}$$

$$1 \text{ and } -\frac{3}{2}$$

$$1 \text{ and } -\frac{2}{3}$$

- 5** ξ is the set of single-digit positive numbers.
 A is the set of square numbers.
 B is the set of odd numbers.
 C is the set of numbers less than 5

- 5 (a)** List the elements of A'

[1 mark]

Answer _____

- 5 (b)** List the elements of $B \cup C$

[1 mark]

Answer _____



- 6 (a)** Work out $(6.8 \times 10^{-4}) \times (7.5 \times 10^9)$
Give your answer in standard form.

[2 marks]

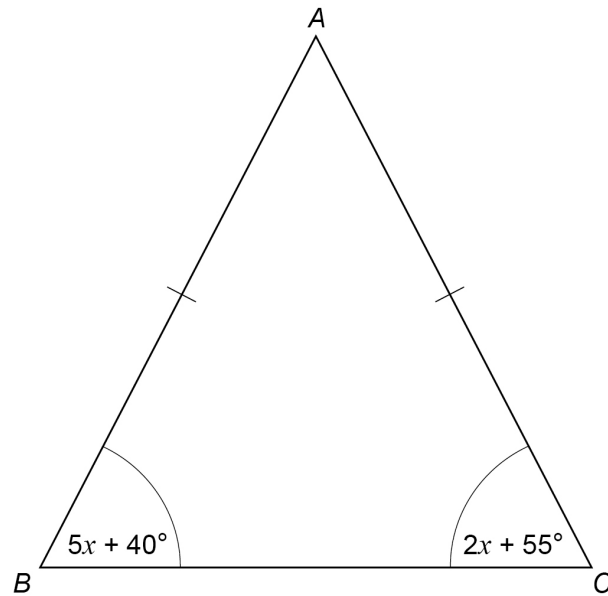
Answer _____

- 6 (b)** Write $8 : 125$ in the form $n : 1$
Give the value of n in standard form.

[2 marks]

Answer _____ :



$$AB = AC$$


Work out the size of angle BAC .

[5 marks]

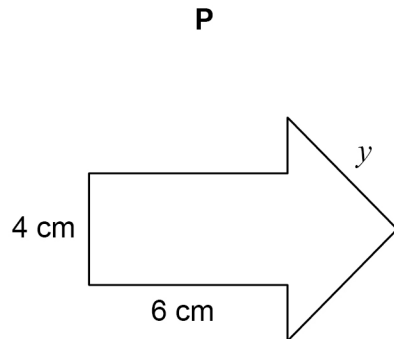
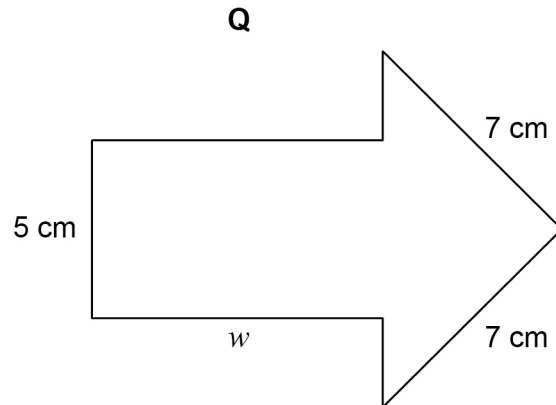
[illegible]

Answer _____



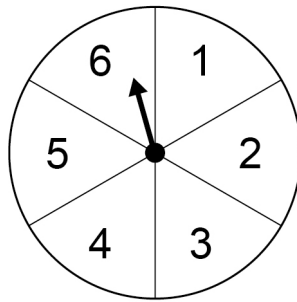
8

Shape Q is an enlargement of shape P.

Not drawn
accuratelyWork out the values of w and y .**[3 marks]**

 $w =$ _____ cm $y =$ _____ cm


- 9 (a)** A fair spinner has 6 equal sections.



Here are the results of 8 spins.

5 2 1 4 3 5 5 5

Write down the probability that the next spin is a 5

[1 mark]

Answer _____

- 9 (b)** Xin is going to toss a fair coin 50 times.

She says,

“I will definitely get 25 heads and 25 tails.”

Give a reason why she is **not** correct.

[1 mark]



- 10** Ling and Su share \$168 in the ratio 3 : 5

How much money does Ling get?

[2 marks]

Answer \$ _____

- 11** Simplify fully $\frac{11x}{12} - \left(\frac{x}{3} + \frac{x}{2}\right)$

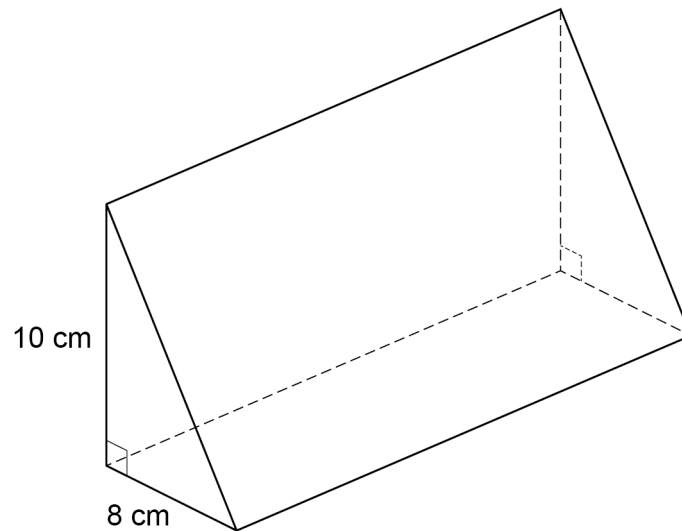
[3 marks]

Answer _____



12

Here is a triangular prism.

The volume of the prism is 960 cm^3

Work out the length of the prism.

[3 marks]

Answer _____ cm



13 (a) A polygon has 9 sides.

Circle the sum of the interior angles of the polygon.

[1 mark]

1260°

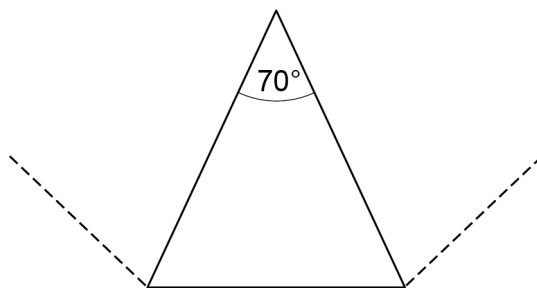
1440°

1620°

1980°

13 (b) The angle at the centre of a different polygon is 70°

Not drawn
accurately



Is this a regular polygon?

Tick **one** box.

Yes

☐

No

☐

Cannot tell

☐

Give a reason for your answer.

[1 mark]



- 14** John sells cars.
Last year
he sold 30 red cars
the relative frequency of a car he sold being red was 0.15

- 14 (a)** Show that he sold 200 cars in total last year.

[1 mark]

- 14 (b)** The table shows information about the 200 cars John sold last year.

	Red	Black	Silver	White
Number of cars	30	$n + 50$	$3n$	$2n$

Work out the relative frequency of a car he sold being white.

[4 marks]

Answer _____

Turn over ►



- 15** Rearrange $3x + a = cx + 5$ to make x the subject.

[3 marks]

Answer _____

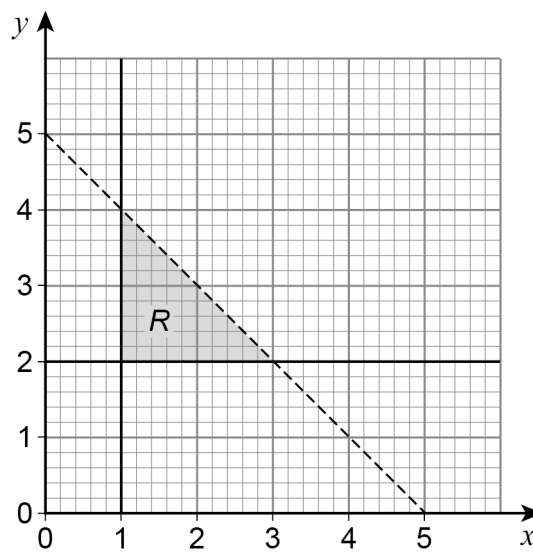
- 16** The value of a computer decreases by 55%
The new value is \$1170
Work out the original value.

[3 marks]

Answer \$ _____



17



Which set of inequalities describes the region R ?

Tick **one** box.

[1 mark]

$x > 1, x + y \leq 5, y > 2$

☐

$x \geq 1, x + y < 5, y \geq 2$

☐

$x > 1, x + y \geq 5, y > 2$

☐

$x \geq 1, x + y > 5, y \geq 2$

☐

Turn over ►



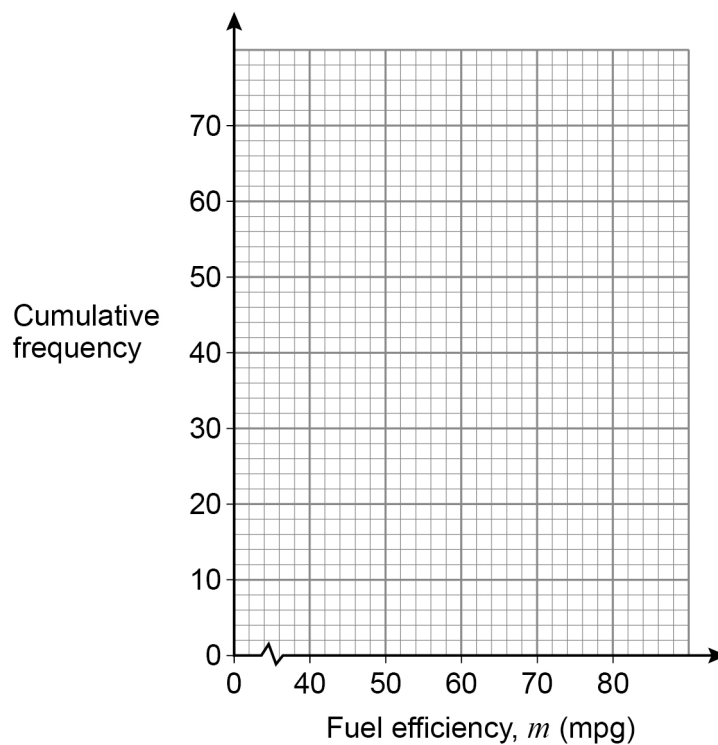
18

Fuel efficiency can be measured in miles per gallon (mpg).

The table shows some information about the fuel efficiency, m , of 70 vans.

Fuel efficiency, m (mpg)	Cumulative frequency
$m \leq 40$	0
$m \leq 50$	8
$m \leq 60$	43
$m \leq 70$	66
$m \leq 80$	70

18 (a) Draw a cumulative frequency diagram to represent the information.

[2 marks]

- 18 (b)** Estimate the number of these vans that have a fuel efficiency of **more** than 56 mpg

[2 marks]

Answer _____

- 19** The point (2, 3) lies on the graph $y = \frac{k}{x}$ where k is a constant.

Work out the value of y when $x = 0.2$

[3 marks]

Answer _____



20

Circle the matrix that represents a reflection in the y -axis.

[1 mark]

$$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$$

$$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$$

$$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$$

21

Differentiate

$$\frac{7x^5 - 3x^8}{x^3}$$

[3 marks]

Answer _____



22

Two sets of students took a test.

The table shows information about their marks.

	Lower quartile	Median	Interquartile range
Set E	48	51	11
Set F	43	54	16

Here are some statements about the data.

Tick **one** box for each statement.**[4 marks]**

	True	False	Cannot tell
Set F had more consistent marks than Set E.	☐	☐	☐
The highest mark was scored by a student in Set F.	☐	☐	☐
The upper quartile for both sets was the same.	☐	☐	☐
A student in Set F scored 54 marks.	☐	☐	☐

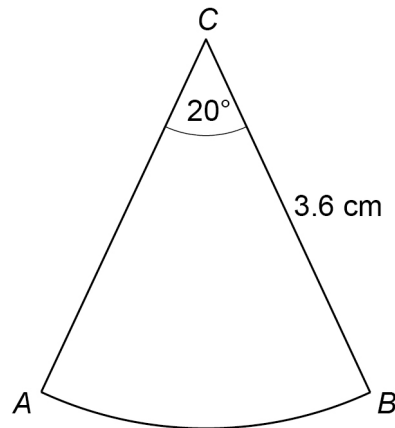
Turn over for the next question**Turn over ►**

23

The diagram shows an earring made from wire.

AB is an arc of a circle, centre C .

Not drawn
accurately



Work out the **total** length of wire used to make the earring.

Give your answer as a decimal.

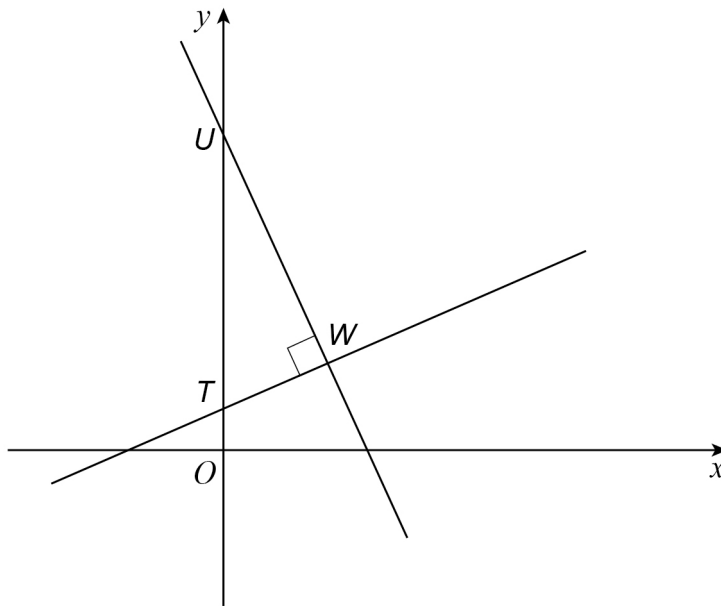
[3 marks]

Answer _____ cm



24

Two perpendicular lines intersect at point W .
The lines intersect the y -axis at points T and U .
 T is $(0, 3)$ and W is $(6, 5)$



Not drawn
accurately

Work out the y -coordinate of U .

[4 marks]

Answer _____



25 $P = \frac{x-16}{x+1} + \frac{2x+5}{x}$

25 (a) Show that $P = \frac{3x^2 - 9x + 5}{x(x+1)}$

[3 marks]

25 (b) Hence work out the values of x when $P = 0$

[3 marks]

Answer _____



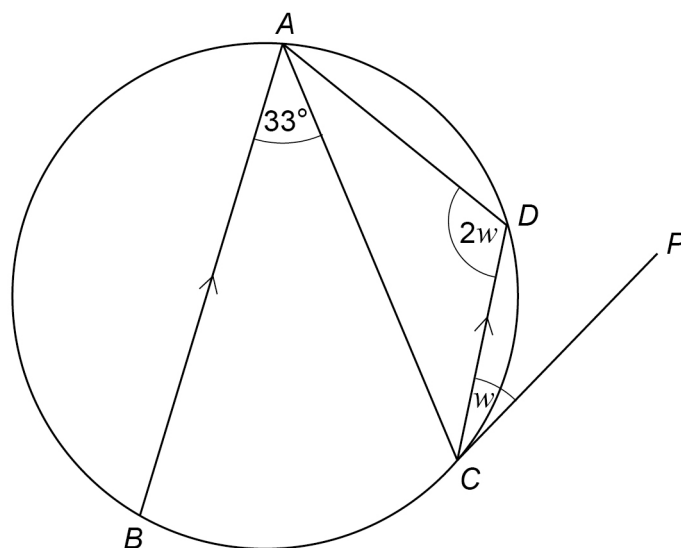
26

A, B, C and D are points on a circle.

BA is parallel to CD .

PC is a tangent.

Angle $DCP = w$



Not drawn
accurately

Work out the size of angle w .

[3 marks]

Answer _____°

Do not write
outside the
box

Turn over ►



27 $2x - y = -2$ and $3^{(x+y)} = 3$

Work out the values of x and y .

[3 marks]

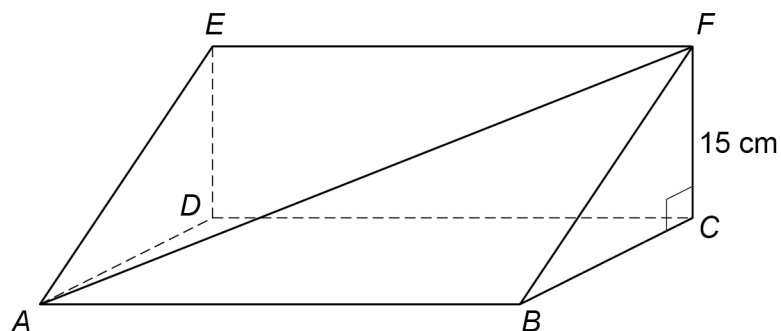
$x =$ _____ $y =$ _____



28

$ABCDEF$ is a right-angled triangular prism.

Do not write
outside the
box



$$AF = 27 \text{ cm}$$

Work out the angle between AF and the plane $ABCD$.

[2 marks]

Answer _____ °



29

Two consecutive numbers can be written as n and $(n + 1)$

Use algebra to prove that the sum of the **squares** of two consecutive numbers is an odd number.

[3 marks]



a is a positive number less than 1

Circle the expression that has a value less than a .

[1 mark]

$a^{\frac{1}{2}}$

$$a^{-\frac{1}{2}}$$

$a^{\frac{3}{2}}$

$$a^{-\frac{3}{2}}$$

Convert $0.\overline{84}$ to a fraction in its simplest form.

You **must** show your working.

[3 marks]

[illegible]

Answer

7

Turn over ►



32 M is inversely proportional to the square of d .

$M = 6.5$ when $d = 8$

32 (a) Work out an equation connecting M and d .

[3 marks]

Answer _____

32 (b) Work out d when $M = 4.8$

[2 marks]

Answer _____



33

Bahram and Callan start cycling at the same time.

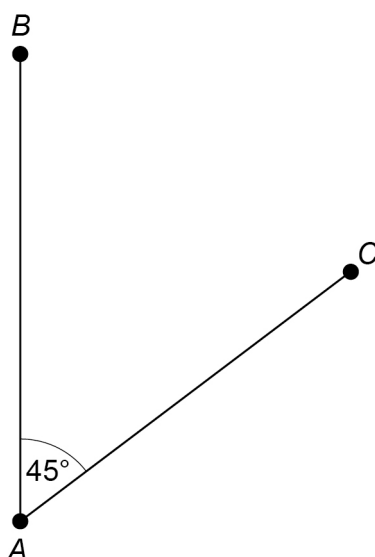
They both start from point A.

Bahram cycles North at an average speed of 25 km/h

Callan cycles North East at an average speed of 18 km/h

The diagram shows the positions of Bahram (B) and Callan (C) after 30 minutes.

North
↑



Not drawn
accurately

Work out the distance BC .

[4 marks]

Answer _____ km



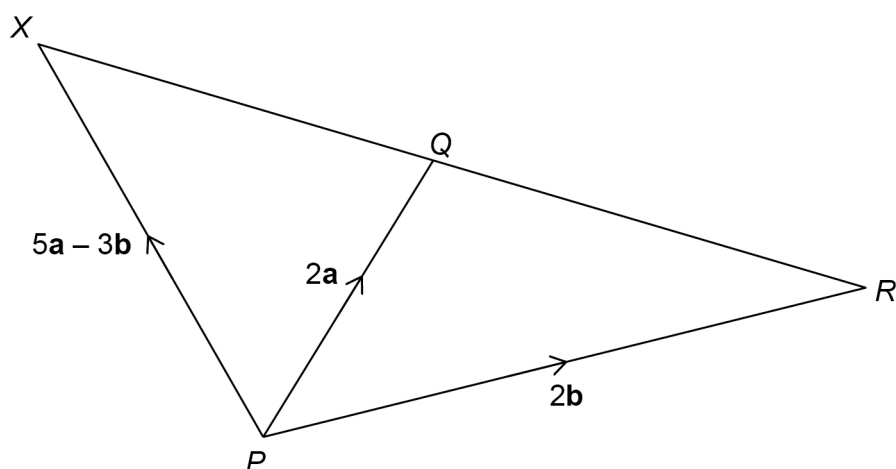
34

By rationalising the denominator, show that $\frac{21+\sqrt{7}}{3-\sqrt{7}}$ simplifies to $a+b\sqrt{7}$
where a and b are integers.
You **must** show your working.

[3 marks]



35

Not drawn
accurately

$$\overrightarrow{RX} = k\overrightarrow{RQ}$$

Work out the value of k .

[3 marks]

Answer _____

END OF QUESTIONS



There are no questions printed on this page

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outside the
box*

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ANSWER IN THE SPACES PROVIDED**



[illegible]

Question number	<p style="text-align: center;">Additional page, if required. Write the question numbers in the left-hand margin.</p>
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