Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

MATHEMATICS **0580/21**

Paper 2 (Extended) **May/June 2019**

1 hour 30 minutes

Candidates answer on the Question Paper.

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

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
If working is needed for any question it must be shown below that question.
Electronic calculators should be used.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 70.

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1 Work out \$1.20 as a percentage of \$16.

View solution

.....% [1]

2 Factorise $5y - 6py$.

View solution

..... [1]

3 Calculate $\sqrt[3]{8.1^2 - 1.3^{0.8}}$.

View solution

..... [1]

4 An equilateral triangle has sides of length 15 cm, correct to the nearest centimetre.

View solution

Calculate the upper bound of the perimeter of this triangle.

..... cm [1]

5 The volume of a cuboid is 180 cm^3.
The base is a square of side length 6 cm.

View solution

Calculate the height of this cuboid.

..... cm [2]

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6 Simplify.

(a) $t^{21} \div t^7$

View solution

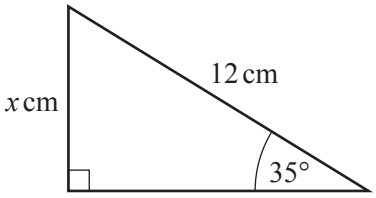
..... [1]

(b) $(u^5)^5$

View solution

..... [1]

7



NOT TO SCALE

View solution

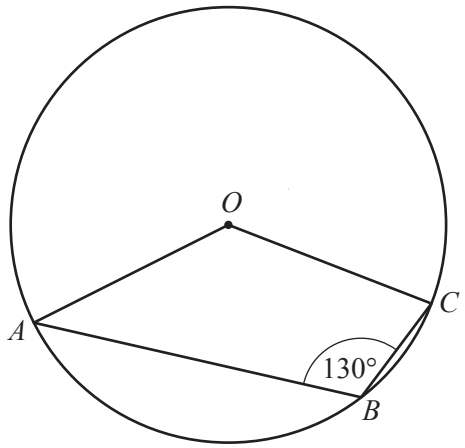
The diagram shows a right-angled triangle.

Calculate the value of x.

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

8

View solution



NOT TO SCALE

A, B and C are points on the circle, centre O.

Find the obtuse angle AOC.

Angle AOC = ... [2]

9 Write the recurring decimal $0.4\dot{7}$ as a fraction.
Show all your working.

View solution

..... [2]

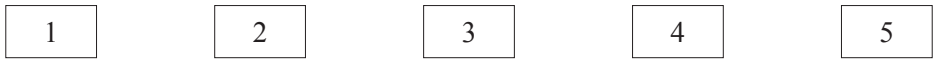
10 $f(x) = 2x + 3$

View solution

Find $f(1 - x)$ in its simplest form.

..... [2]

11



View solution

The diagram shows five cards.
Two of the cards are taken at random, without replacement.

Find the probability that both cards show an even number.

..... [2]

12 27 28 29 30 31 32 33

From the list of numbers, write down

(a) a multiple of 7,

View solution

..... [1]

(b) a cube number,

View solution

..... [1]

(c) a prime number.

View solution

..... [1]

13 $x^2 + 4x - 9 = (x + a)^2 + b$

View solution

Find the value of a and the value of b.

$a =$ .....

$b =$ ..... [3]

14 **Without using a calculator**, work out $\frac{5}{6}+\frac{2}{3}$.

View solution

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

..... [3]

15 Expand and simplify.

$$(x+1)(x+2)+2x(x-3)$$

View solution

..... [3]

16 y is inversely proportional to the square root of $(x + 1)$.
When $x = 8$, $y = 2$.

View solution

Find y when $x = 99$.

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

17 **(a)** Factorise $p^2 - q^2$.

View solution

..... [1]

(b) $p^2 - q^2 = 7$ and $p - q = 2$.

Find the value of $p + q$.

View solution

..... [2]

18 **(a)** Simplify $\left(81y^{16}\right)^{\frac{3}{4}}$.

View solution

..... [2]

(b) $2^3 = 4^p$

Find the value of p.

View solution

$p =$ ..... [1]

19 A model of a car has a scale 1 : 20.
The volume of the actual car is $12\,\text{m}^3$.

View solution

Find the volume of the model.
Give your answer in cubic centimetres.

.....cm^3 [3]

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20 Write as a single fraction in its simplest form.

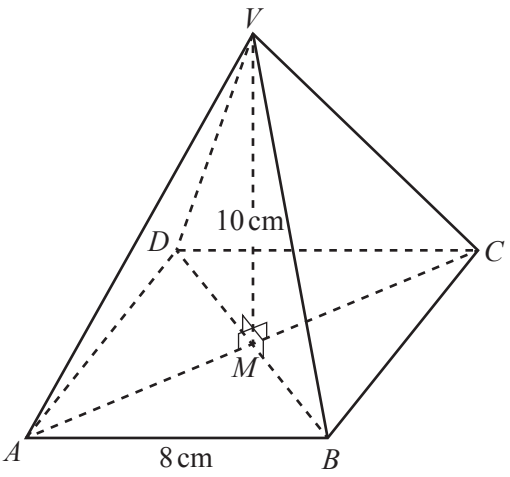
View solution

$$\frac{1}{x+2} - \frac{2}{3x-1}$$

..... [3]

21

View solution



NOT TO SCALE

The diagram shows a pyramid with a square base $ABCD$ of side length 8 cm.
The diagonals of the square, AC and BD, intersect at M.
V is vertically above M and $VM = 10$ cm.

Calculate the angle between VA and the base.

..... [4]

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22 **(a)** These are the first four terms of a sequence.

View solution

5 8 11 14

(i) Write down the next term.

..... [1]

(ii) Find an expression, in terms of n, for the nth term.

View solution

..... [2]

(b) These are the first five terms of another sequence.

View solution

$$\frac{1}{2} \quad \frac{3}{4} \quad \frac{7}{6} \quad \frac{13}{8} \quad \frac{21}{10}$$

Find the next term.

..... [1]

23 $\mathbf{P} = \begin{pmatrix} 3 & 1 \\ 2 & 4 \end{pmatrix}$

(a) Find $\mathbf{P}^2$.

View solution

( ) [2]

(b) Find $\mathbf{P}^{-1}$.

View solution

( ) [2]

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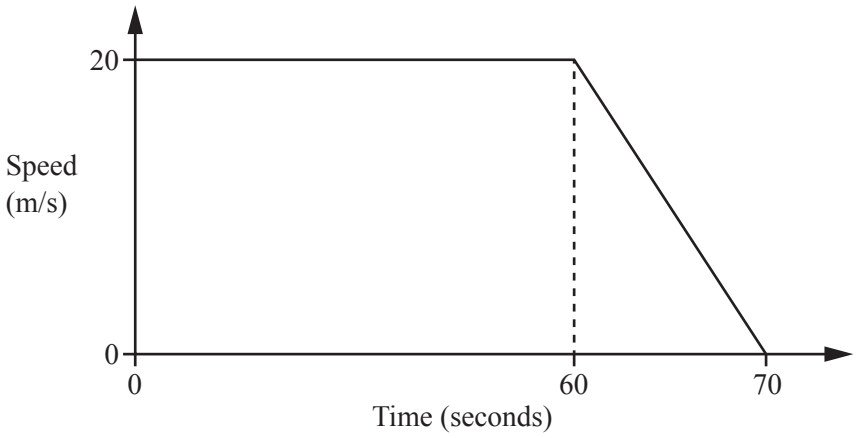
24



NOT TO
SCALE

The diagram shows information about the final 70 seconds of a car journey.

(a) Find the deceleration of the car between 60 and 70 seconds.

View solution

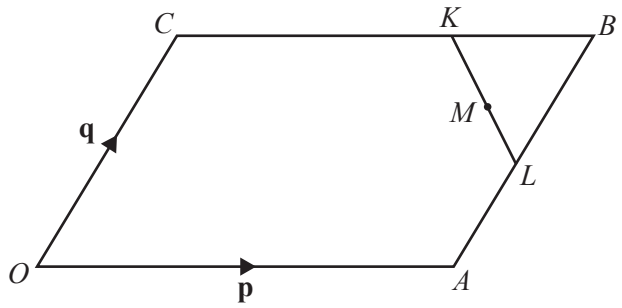
..... m/s^2 [1]

(b) Find the distance travelled by the car during the 70 seconds.

View solution

..... m [3]

25



NOT TO SCALE

$OABC$ is a parallelogram and O is the origin.
$CK = 2KB$ and $AL = LB$.
M is the midpoint of KL.
$\overrightarrow{OA} = \mathbf{p}$ and $\overrightarrow{OC} = \mathbf{q}$.

Find, in terms of **p** and **q**, giving your answer in its simplest form

(a) $\overrightarrow{KL}$,

View solution

$\overrightarrow{KL} =$ ..... [2]

(b) the position vector of M.

View solution

..... [2]

Question 26 is printed on the next page.

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26 Line L passes through the points $(0, -3)$ and $(6, 9)$.

(a) Find the equation of line L.

View solution

..... [3]

(b) Find the equation of the line that is perpendicular to line L and passes through the point $(0, 2)$.

View solution

..... [2]

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