Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

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9234847966

MATHEMATICS **0580/22**

Paper 2 (Extended) **February/March 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.

This document consists of **11** printed pages and **1** blank page.

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[Turn over

1 The temperature at 07 00 is −3 °C.
This temperature is 11 °C higher than the temperature at 01 00.

Find the temperature at 01 00.

..... °C [1]

2 Jodi swims 22 lengths of a swimming pool to raise money for charity.
She receives $15 for each length she swims.

Calculate how much money Jodi raises for charity.

$..... [1]

3 Write the recurring decimal $0.\dot{2}\dot{3}$ as a fraction.

..... [1]

4 **(a)** Write 0.046 875 correct to 2 significant figures.

..... [1]

(b) Write 2 760 000 in standard form.

..... [1]

5 A tourist changes $500 to euros (€) when the exchange rate is €1 = $1.0697 .

Calculate how many euros he receives.

€..... [2]

6 The probability that a sweet made in a factory is the wrong shape is 0.0028 .
One day, the factory makes 25 000 sweets.

Calculate the number of sweets that are expected to be the wrong shape.

..... [2]

7 The bearing of Alexandria from Paris is 128°.

Calculate the bearing of Paris from Alexandria.

..... [2]

8 O is the origin, $\overrightarrow{OA} = 2\mathbf{x} + 3\mathbf{y}$ and $\overrightarrow{BA} = \mathbf{x} - 4\mathbf{y}$.

Find the position vector of B, in terms of $\mathbf{x}$ and $\mathbf{y}$, in its simplest form.

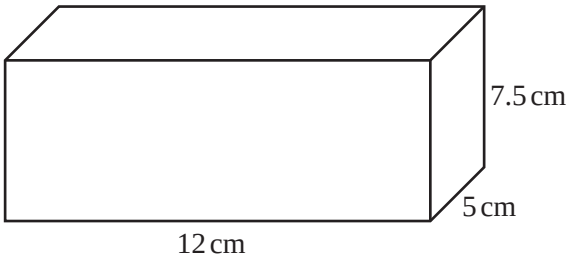
..... [2]

9 y is directly proportional to $(x-4)$.
When $x = 16$, $y = 3$.

Find y in terms of x.

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

10



NOT TO SCALE

Calculate the total surface area of the cuboid.

..... cm^2 [3]

11 The number of passengers on a train increases from 63 to 77.

Calculate the percentage increase.

..... % [3]

12 A cone with height 14.8 cm has volume 275 cm^3.

Calculate the radius of the cone.

[The volume, V, of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

..... cm [3]

13 Factorise.

(a) $7k^2 - 15k$

..... [1]

(b) $12(m+p) + 8(m+p)^2$

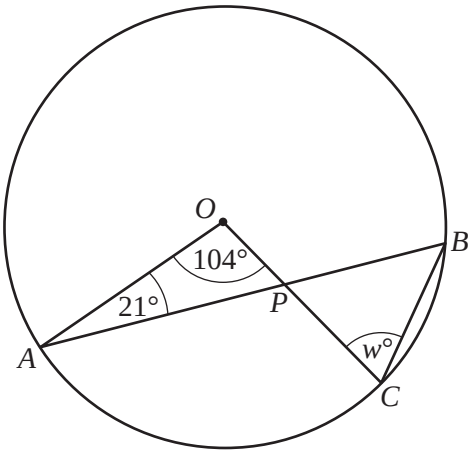
..... [2]

14 Eric invests an amount in a bank that pays compound interest at a rate of 2.16% per year.
At the end of 5 years, the value of his investment is \$6 999.31 .

Calculate the amount Eric invests.

\$..... [3]

15



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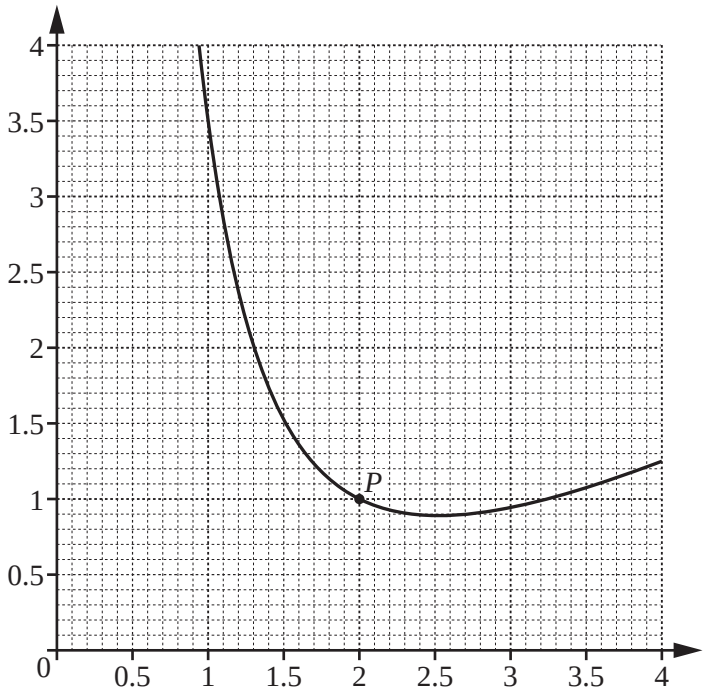
A, *B* and *C* are points on the circle, centre *O*.
AB and *OC* intersect at *P*.

Find the value of *w*.

w = ... [3]

16



By drawing a suitable tangent, estimate the gradient of the curve at the point *P*.

..... [3]

17 **(a)** Find the value of n when $5^n = \frac{1}{125}$.

$n =$ ..... [1]

(b) Simplify $\left(\frac{64}{m^3}\right)^{-\frac{1}{3}}$.

..... [2]

18 A pipe is full of water.
The cross-section of the pipe is a circle, radius 2.6 cm.
Water flows through the pipe into a tank at a speed of 12 centimetres per second.

Calculate the number of litres that flow into the tank in one hour.

..... litres [3]

19 Simplify. $\frac{ab - b^2}{a^2 - b^2}$

..... [3]

20 **(a)** Work out $\begin{pmatrix} 2 & -1 \\ 4 & 3 \end{pmatrix}\begin{pmatrix} 1 & 6 \\ -5 & 4 \end{pmatrix}$.

$\begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$ [2]

(b) Find the value of x when the determinant of $\begin{pmatrix} 3 & -1 \\ -7 & x \end{pmatrix}$ is 5.

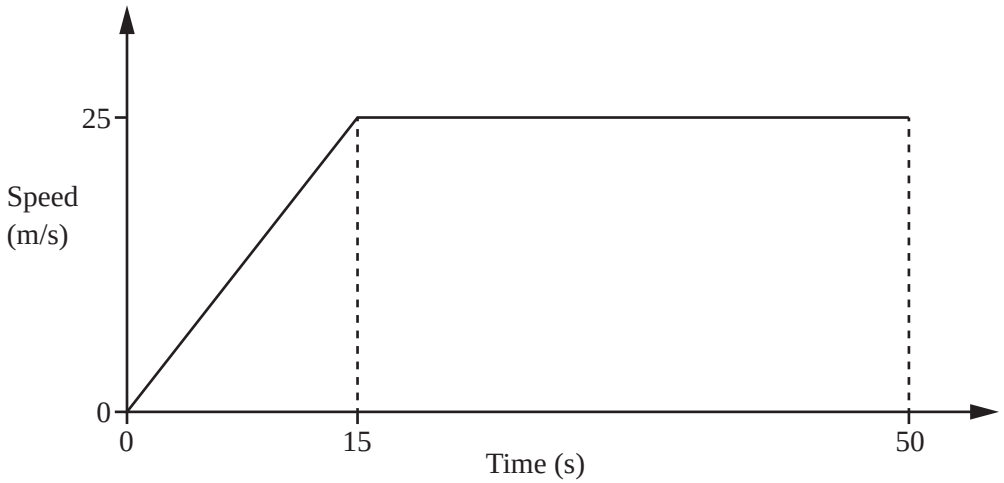
$x =$ ..... [2]

21 **Without using a calculator**, work out $3\frac{1}{8} \div \frac{5}{12}$.

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

..... [4]

22



The speed–time graph shows the first 50 seconds of a journey.

Calculate

(a) the acceleration during the first 15 seconds,

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

(b) the distance travelled in the 50 seconds.

..... m [3]

23 A is the point (2, 3) and B is the point (7, −5).

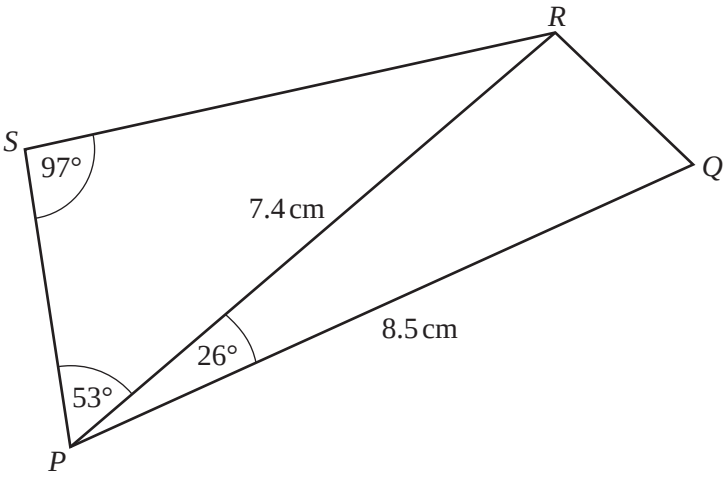
(a) Find the co-ordinates of the midpoint of AB.

(....., ...) [2]

(b) Find the equation of the line through A that is perpendicular to AB.
Give your answer in the form $y = mx + c$.

$y =$ ..... [4]

24



NOT TO SCALE

Calculate

(a) *SR*,

SR = ... cm [3]

(b) *RQ*.

RQ = ... cm [4]

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