



**Cambridge Assessment International Education**  
Cambridge International General Certificate of Secondary Education

CANDIDATE  
NAME

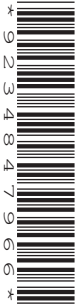
|  |
|--|
|  |
|--|

CENTRE  
NUMBER

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|--|--|--|--|--|

CANDIDATE  
NUMBER

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|



**MATHEMATICS**

**0580/22**

Paper 2 (Extended)

**February/March 2019**

**1 hour 30 minutes**

Candidates answer on the Question Paper.

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

**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  $\pi$ , 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.

- 1 The temperature at 0700 is  $-3^{\circ}\text{C}$ .  
This temperature is  $11^{\circ}\text{C}$  higher than the temperature at 0100.

Find the temperature at 0100.

.....  $^{\circ}\text{C}$  [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 0.046875 correct to 2 significant figures.

..... [1]

(b) Write 2760000 in standard form.

..... [1]

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

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  $128^\circ$ .

Calculate the bearing of Paris from Alexandria.

..... [2]

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

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

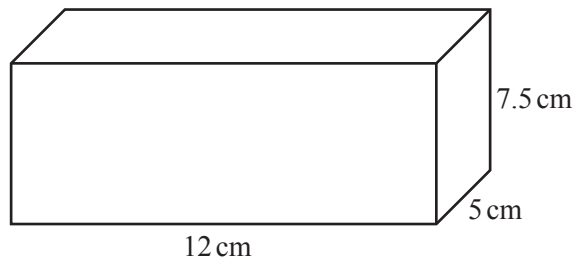
..... [2]

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

Find  $y$  in terms of  $x$ .

$y = \dots\dots\dots$  [2]

10



NOT TO  
SCALE

Calculate the total surface area of the cuboid.

$\dots\dots\dots \text{cm}^2$  [3]

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

Calculate the percentage increase.

$\dots\dots\dots\%$  [3]

- 12 A cone with height 14.8 cm has volume  $275 \text{ cm}^3$ .

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

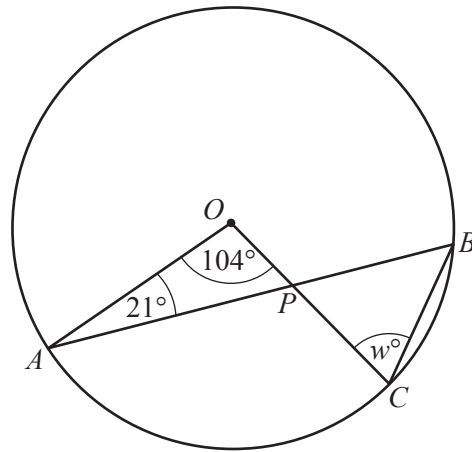
..... [2]

- 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 \$6999.31 .

Calculate the amount Eric invests.

\$..... [3]

15



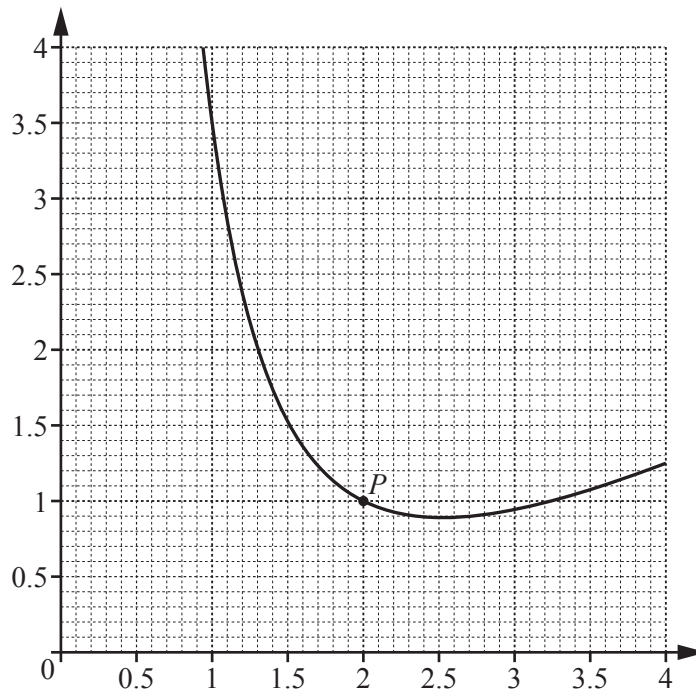
NOT TO SCALE

$A$ ,  $B$  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  $\begin{pmatrix} 2 & -1 \\ 4 & 3 \end{pmatrix} \begin{pmatrix} 1 & 6 \\ -5 & 4 \end{pmatrix}$ .

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

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

$x = \dots\dots\dots$  [2]

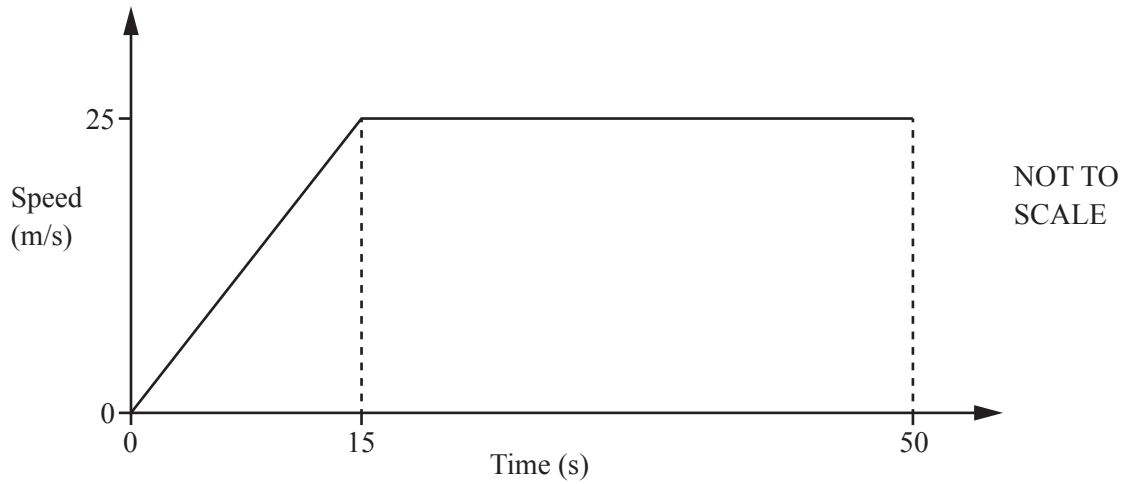
21 Without using a calculator, work out  $3\frac{1}{8} \div \frac{5}{12}$ .

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

$\dots\dots\dots$  [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<sup>2</sup> [1]

(b) the distance travelled in the 50 seconds.

..... m [3]

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

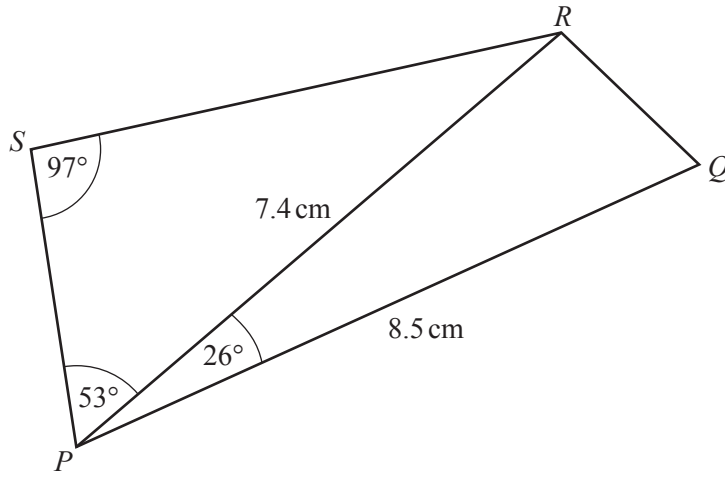
(a) Find the co-ordinates of the midpoint of  $AB$ .

(....., .....) [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)  $SR$ ,

$SR = \dots\dots\dots$  cm [3]

(b)  $RQ$ .

$RQ = \dots\dots\dots$  cm [4]

**BLANK PAGE**

---

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at [www.cambridgeinternational.org](http://www.cambridgeinternational.org) after the live examination series.

Cambridge Assessment International Education is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which itself is a department of the University of Cambridge.