Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

4311357799

MATHEMATICS **0580/23**

Paper 2 (Extended) **May/June 2015**

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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **12** printed pages.

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CAMBRIDGE International Examinations

1 Ahmed and Babar share 240 g of sweets in the ratio 7 : 3.

Calculate the amount Ahmed receives.

Answer ..... g [2]

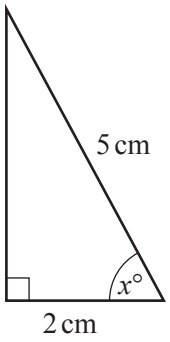
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2 Factorise completely.

$9x^2 - 6x$

Answer ..... [2]

3



NOT TO SCALE

Calculate the value of x.

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

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4 An equilateral triangle has sides of length 6.2 cm, correct to the nearest millimetre.

Complete the statement about the perimeter, P cm, of the triangle.

Answer ..... $\leqslant P <$ ..... [2]

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5 Factorise $2x^2 - 5x - 3$.

Answer ..... [2]

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6 Find the 2×2 matrix that represents a rotation through 90° clockwise about (0, 0).

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

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7 James buys a drink for 2 euros (€).

Work out the cost of the drink in pounds (£) when £1 = €1.252 .
Give your answer correct to 2 decimal places.

Answer £ ..... [3]

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8 **Without using a calculator**, work out $1\frac{7}{8} \div \frac{5}{9}$.

Show all your working and give your answer as a fraction in its lowest terms.

Answer ..... [3]

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9 Solve the equation.

$$3(x + 4) = 2(4x - 1)$$

Answer $x =$ ..... [3]

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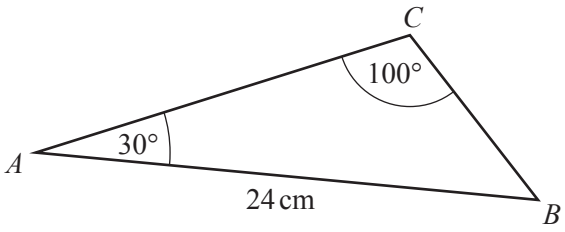
10 In a sale, the cost of a coat is reduced from \$85 to \$67.50 .

Calculate the percentage reduction in the cost of the coat.

Answer ..... % [3]

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11

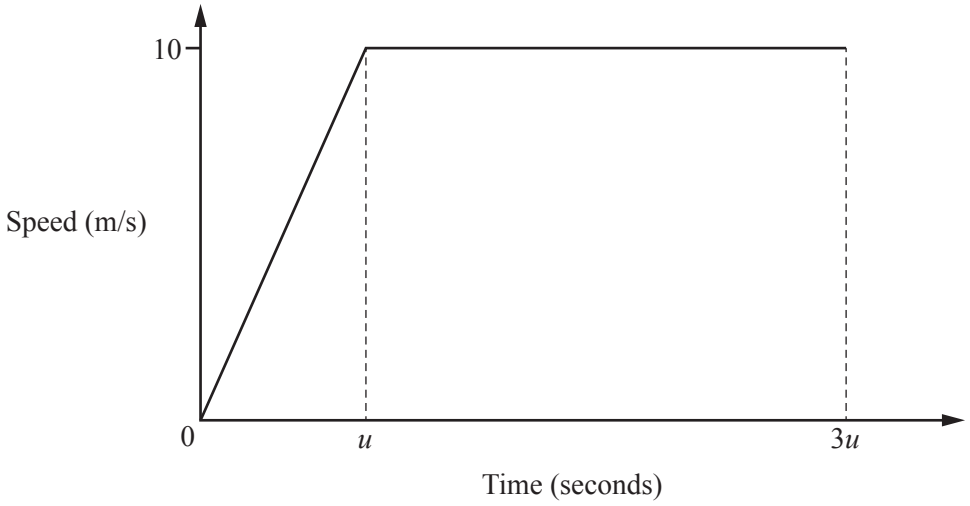


NOT TO SCALE

Use the sine rule to calculate BC.

Answer BC = ... cm [3]

12



NOT TO SCALE

A car starts from rest and accelerates for u seconds until it reaches a speed of 10 m/s.
The car then travels at 10 m/s for $2u$ seconds.
The diagram shows the speed-time graph for this journey.

The distance travelled by the car in the first $3u$ seconds is 125 m.

(a) Find the value of u.

Answer(a) u = ... [3]

(b) Find the acceleration in the first u seconds.

Answer(b) ..... m/s^2 [1]

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13 Simplify.

(a) $12x^{12} \div 3x^3$

Answer(a) ..... [2]

(b) $(256y^{256})^{\frac{1}{8}}$

Answer(b) ..... [2]

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14 Solve the equation.

$$2x^2 + x - 2 = 0$$

Show your working and give your answers correct to 2 decimal places.

Answer x = ... or x = ... [4]

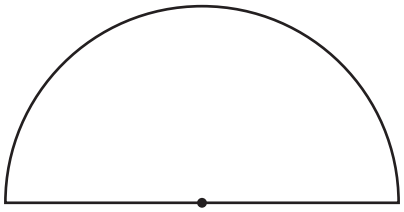
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15 The circumference of a circle is 30 cm.

(a) Calculate the radius of the circle.

Answer(a) ..... cm [2]

(b)

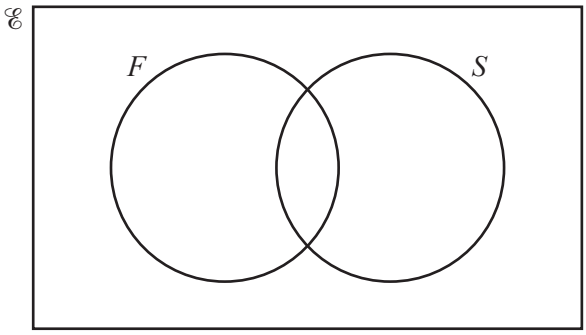


The length of the arc of the semi-circle is 15 cm.

Calculate the area of the semi-circle.

Answer(b) ..... cm^2 [2]

16 **(a)** In this part, you may use this Venn diagram to help you answer the questions.



In a class of 30 students, 25 study French (F), 18 study Spanish (S).
One student does not study French or Spanish.

(i) Find the number of students who study French and Spanish.

Answer(a)(i) ..... [2]

(ii) One of the 30 students is chosen at random.

Find the probability that this student studies French but not Spanish.

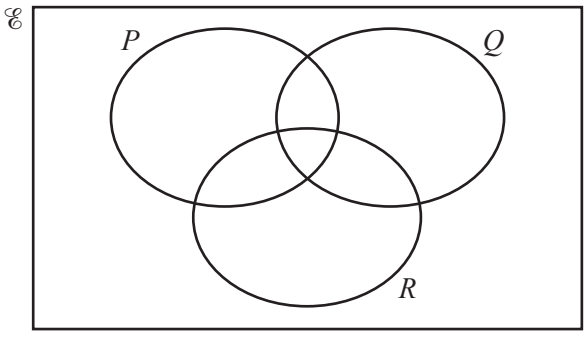
Answer(a)(ii) ..... [1]

(iii) A student who does not study Spanish is chosen at random.

Find the probability that this student studies French.

Answer(a)(iii) ..... [1]

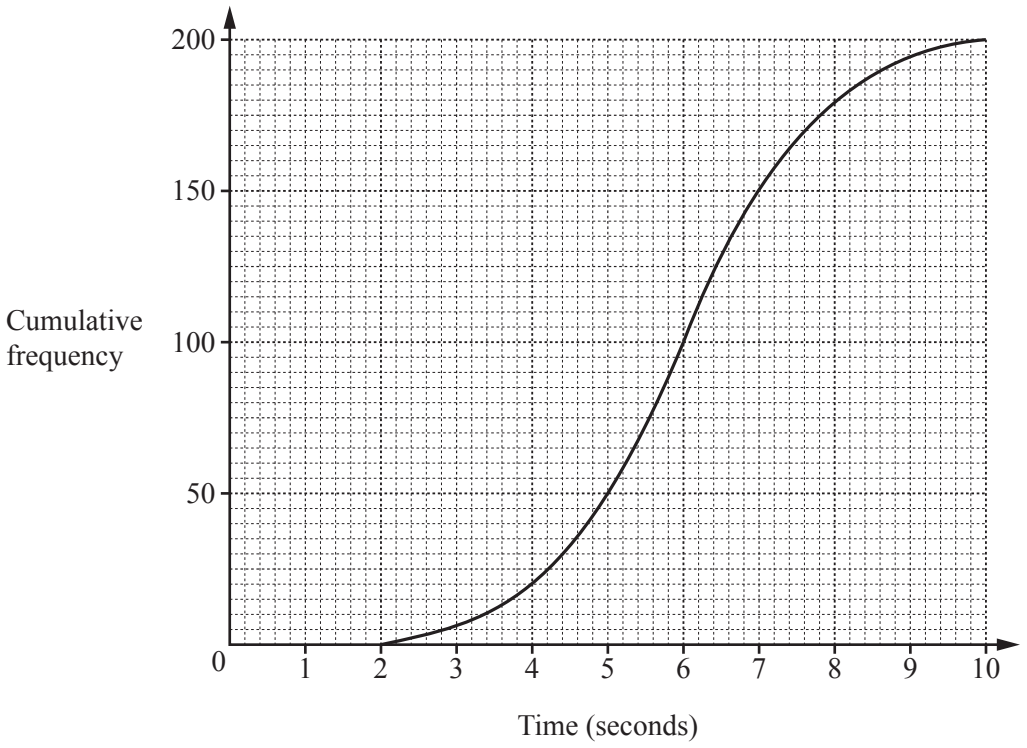
(b)



On this Venn diagram, shade the region $R \cap (P \cup Q)'$. [1]

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200 students take a reaction time test.
The cumulative frequency diagram shows the results.

Find

(a) the median,

Answer(a) ..... s [1]

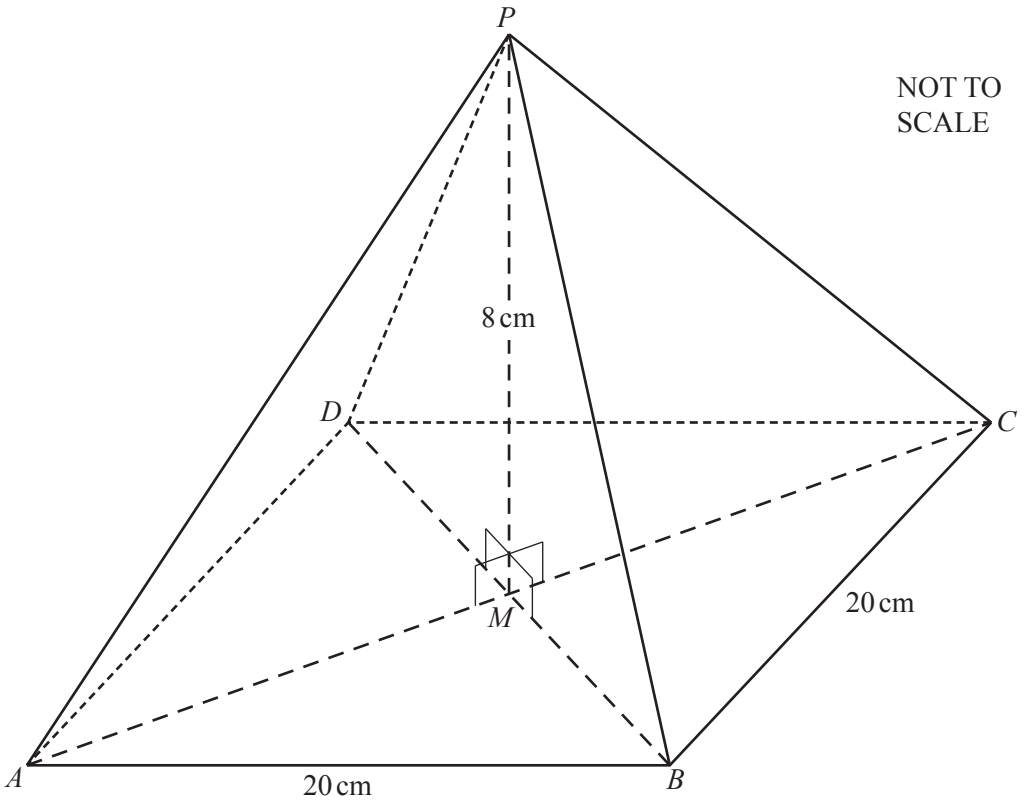
(b) the inter-quartile range,

Answer(b) ..... s [2]

(c) the number of students with a reaction time of more than 4 seconds.

Answer(c) ..... [2]

18



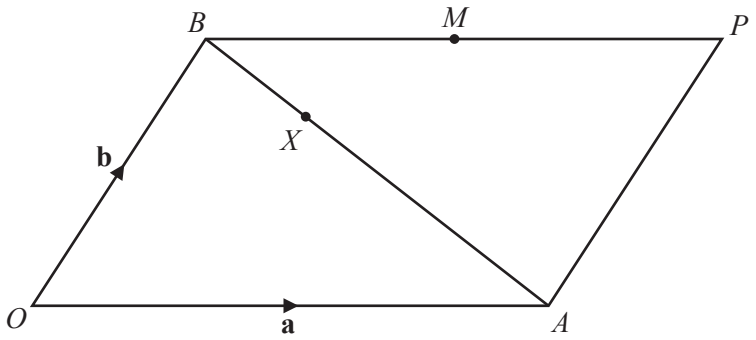
The diagram shows a solid pyramid on a square horizontal base $ABCD$.
The diagonals AC and BD intersect at M.
P is vertically above M.
$AB = 20$ cm and $PM = 8$ cm.

Calculate the total surface area of the pyramid.

Answer ..... cm^2 [5]

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NOT TO SCALE

OAPB is a parallelogram.
O is the origin, $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.
M is the midpoint of *BP*.

(a) Find, in terms of **a** and **b**, giving your answer in its simplest form,

(i) $\overrightarrow{BA}$,

Answer(a)(i) $\overrightarrow{BA}$ = ... [1]

(ii) the position vector of *M*.

Answer(a)(ii) ..... [1]

(b) *X* is on *BA* so that $BX : XA = 1 : 2$.

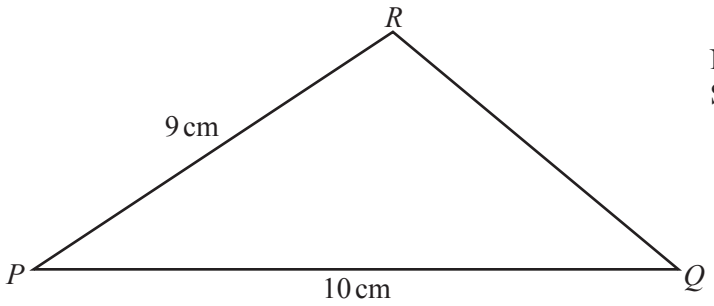
Show that *X* lies on *OM*.

Answer(b)

[4]

Question 20 is printed on the next page.

20



NOT TO SCALE

The area of triangle PQR is $38.5\,\text{cm}^2$.

Calculate the length QR.

Answer QR = ... cm [6]

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