UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

9869593646

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/03**

Paper 3 (Core) **October/November 2012**

1 hour 45 minutes

Candidates answer on the Question Paper

Additional Materials: Geometrical Instruments
Graphics Calculator

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.
Do not use staples, paper clips, highlighters, glue or correction fluid.
You may use a pencil for any diagrams or graphs.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** the questions.
Unless instructed otherwise, give your answers exactly or correct to three significant figures as appropriate.
Answers in degrees should be given to one decimal place.
For π, use your calculator value.
You must show all the relevant working to gain full marks and you will be given marks for correct methods, including sketches, even if your answer is incorrect.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is 96.

For Examiner's Use

This document consists of **16** printed pages.

Formula List

Area, A, of triangle, base b, height h.	$A = \frac{1}{2}bh$
Area, A, of circle, radius r.	$A = \pi r^2$
Circumference, C, of circle, radius r.	$C = 2\pi r$
Curved surface area, A, of cylinder of radius r, height h.	$A = 2\pi rh$
Curved surface area, A, of cone of radius r, sloping edge l.	$A = \pi rl$
Curved surface area, A, of sphere of radius r.	$A = 4\pi r^2$
Volume, V, of prism, cross-sectional area A, length l.	$V = Al$
Volume, V, of pyramid, base area A, height h.	$V = \frac{1}{3}Ah$
Volume, V, of cylinder of radius r, height h.	$V = \pi r^2 h$
Volume, V, of cone of radius r, height h.	$V = \frac{1}{3}\pi r^2 h$
Volume, V, of sphere of radius r.	$V = \frac{4}{3}\pi r^3$

Answer **all** the questions.

1 1000 people are asked how they travel to work.
150 walk, 450 travel by bus and 25 cycle.
All the rest travel by car.

(a) How many people travel to work by car?

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

(b) Find the percentage of people who walk to work.

Answer(b) ..... % [1]

(c) The number of people who travel by bus is in the ratio

men : women = 3 : 2.

Calculate the number of men who travel by bus.

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

(d) Aisha draws a pie chart to show how the 1000 people travel to work.

Calculate the sector angle which shows the number of people who walk to work.
(Do not draw the pie chart.)

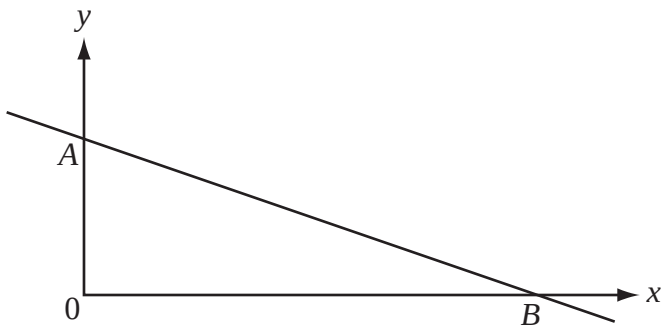
Answer(d) ..... [2]

(e) One of the 1000 people is chosen at random.

What is the probability that this person travels to work by bus?
Give your answer as a fraction in its lowest terms.

Answer(e) ..... [2]

2



NOT TO SCALE

The equation of the straight line through A and B is $3x + 8y = 24$.
The line cuts the y-axis at A and the x-axis at B.

(a) Find the co-ordinates of A.

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

(b) Find the co-ordinates of B.

Answer(b) (..... , ...) [1]

(c) Find the gradient of AB.

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

(d) M is the midpoint of AB.

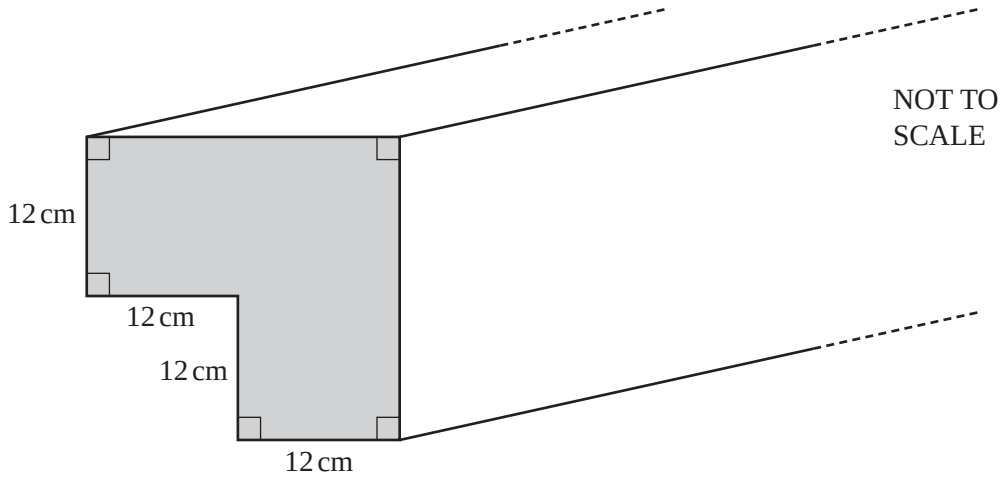
Write down the co-ordinates of M.

Answer(d) (..... , ...) [2]

(e) Write down the vector $\overrightarrow{OM}$ in component form.

Answer(e) $\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

3



The diagram shows a piece of wood with the cross-section shaded.

(a) Calculate the area of the cross-section.

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

(b) The piece of wood is 5 **metres** long.

(i) Calculate the volume of the piece of wood in cm^3.

Answer(b)(i) ..... cm^3 [2]

(ii) Write your answer to **part(b)(i)** in cubic metres.

Answer(b)(ii) ..... m^3 [1]

(c) A builder needs 200 of these 5 metre long pieces of wood to construct a house.
The wood costs $9.45 per metre.

Calculate the total cost of the wood.

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

4 **(a)** Find the value of $(p - q)^2$ when $p = 5.2$ and $q = -2.3$.

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

(b) Solve the simultaneous equations.

$$3x + 2y = 18$$
$$4x - 2y = -4$$

Answer(b) $x =$ .....

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

(c) Simplify $3x^5 \times 2x^3$.

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

(d) Solve the following equation.

$$2(3x - 5) - 3(x + 1) = 5$$

Answer(d) $x =$ ..... [3]

(e) $2^x = 2^4 + 2^4$

Find the value of x.

Answer(e) $x =$ ..... [2]

5 The marks gained by 20 students in a quiz are shown in the table.

Mark	1	2	3	4	5
Frequency	9	3	5	2	1

Find

(a) the mode,

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

(b) the mean,

Answer(b) ..... [1]

(c) the median,

Answer(c) ..... [1]

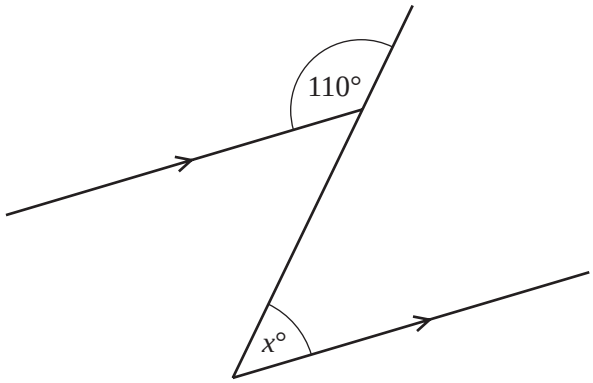
(d) the lower quartile,

Answer(d) ..... [1]

(e) the range.

Answer(e) ..... [1]

6 **(a)**

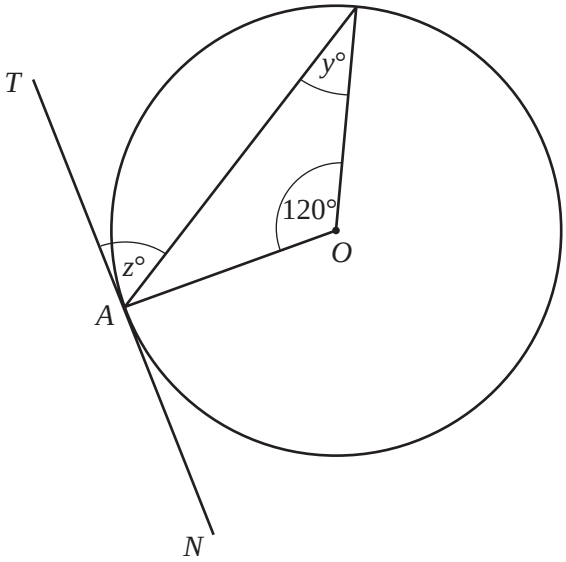


NOT TO SCALE

Find the value of x.

Answer(a) $x =$ ..... [1]

(b)



NOT TO SCALE

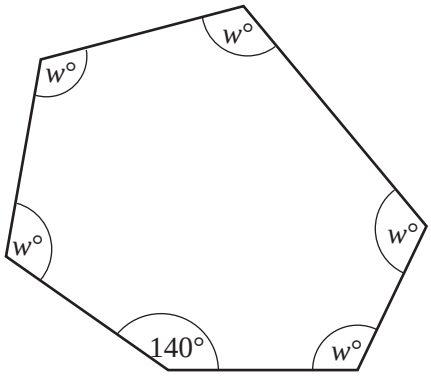
TAN is a tangent, at *A*, to the circle, centre *O*.
OA is a radius.

Find the values of y and z.

Answer(b) $y =$ .....

$z =$ ..... [3]

(c)



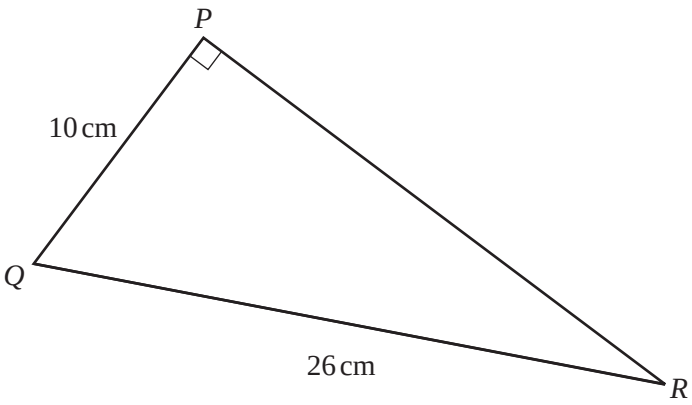
NOT TO SCALE

One angle in a hexagon is 140°.
Each of the other angles is w°.

Find the value of w.

Answer(c) $w =$ ..... [3]

7



NOT TO SCALE

(a) Calculate *PR*.

Answer(a) ..... cm [3]

(b) Find the area of triangle *PQR*.

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

(c) Use trigonometry to calculate the size of angle *PRQ*.

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

8 $f(x) = 2x(x - 4)$

(a) On the diagram sketch the graph of $y = f(x)$ for $-1 \leqslant x \leqslant 6$.

[3]

(b) Find the co-ordinates of the minimum point of the graph.

Answer(b) (..... , ...) [1]

(c) Write down the equation of the line of symmetry of the graph.

Answer(c) ..... [1]

(d) On the same diagram sketch the graph of $y = 3x - 4$. [2]

(e) Write down the co-ordinates of the points where $2x(x - 4) = 3x - 4$.
Give each answer correct to 3 decimal places.

Answer(e) (..... , ...)

(..... , ...) [3]

9 3 4 5 6 7 8 9 10 11

(a) Joachim chooses a number from the list above at random.

Find the probability that the number is

(i) an odd number,

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

(ii) a prime number,

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

(iii) a factor of 12,

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

(iv) a multiple of 3,

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

(v) a power of 2.

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

(b) x is a number in the list above where $6 < x \leqslant 9$.

Write down all the possible values for x.

Answer(b) ..... [1]

10 A bank pays interest at a rate of 2.5% each year.

(a) Lukas invests $5000 in the bank.
At the end of each year he removes the interest from his bank account.

Calculate the **total** amount of interest he has removed after 4 years.

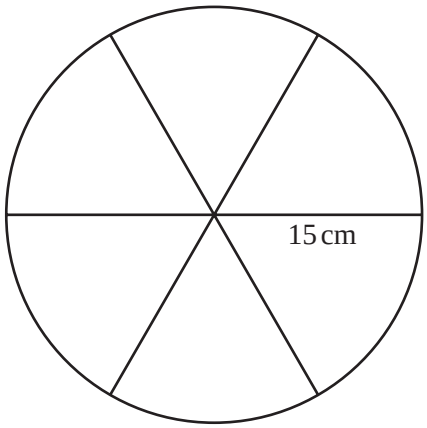
Answer(a) $ ..... [3]

(b) Marcus also invests $5000 in the bank.
He does not remove any money from the bank for 4 years.

Calculate how much **more** interest Marcus will have than Lukas at the end of the 4 years.

Answer(b) $ ..... [4]

11



The diagram shows the top of a circular pizza with a radius of 15 cm.
It is cut into 6 equal slices.

(a) Calculate the area of the top of the whole pizza.

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

(b) Find the area of the top of one slice of pizza.

Answer(b) ..... cm^2 [1]

(c) Find the length of the curved edge of one slice.

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

(d) The whole pizza costs \$12 to make.
Each slice of pizza is sold for \$2.75 .

Calculate the percentage profit made by selling all six slices.

Answer(d) ..... % [4]

12 A large number of plants are grown from seeds.

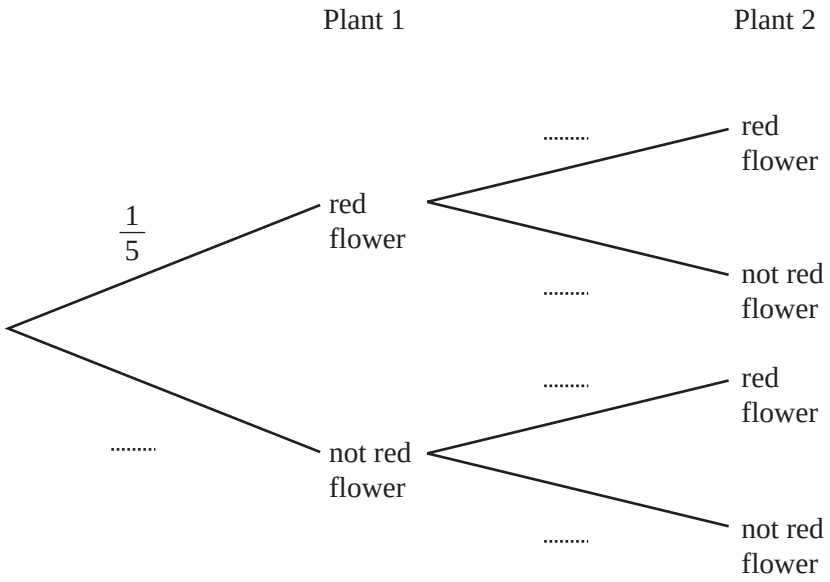
The probability that a plant has a red flower is $\frac{1}{5}$.

(a) Find the probability that a plant does **not** have a red flower.

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

(b) Two of these plants are chosen at random.

(i) Complete the tree diagram.



[2]

(ii) Find the probability that both plants have red flowers.

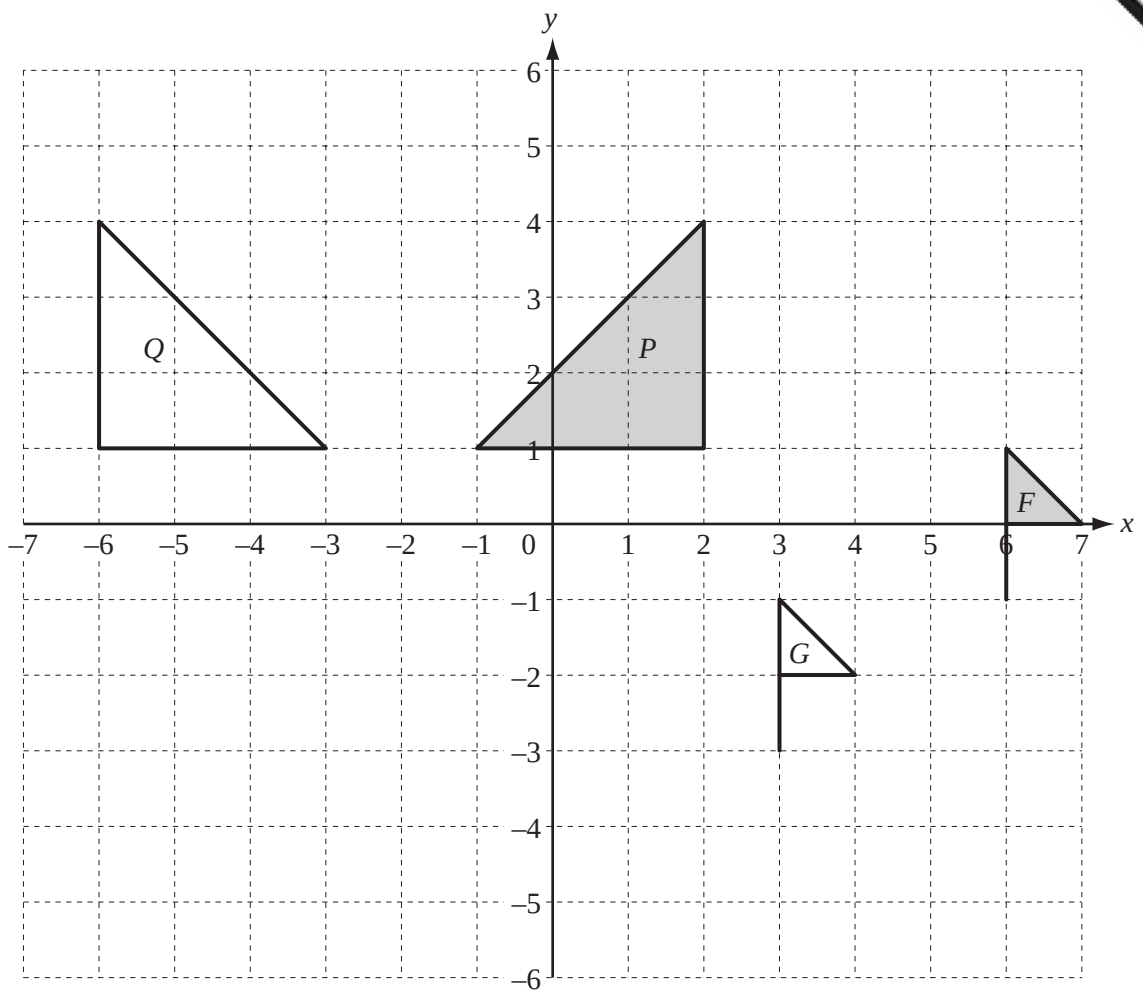
Answer(b)(ii) ..... [2]

(iii) Find the probability that only one of the two plants has a red flower.

Answer(b)(iii) ..... [3]

Question 13 is on the next page.

13



(a) Describe fully the **single** transformation that maps F onto G.

.....

..... [2]

(b) Describe fully the **single** transformation that maps P onto Q.

.....

..... [2]