Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/21**

Paper 2 (Extended) **May/June 2016**

45 minutes

Candidates answer on the Question Paper.

Additional Materials: 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.
Do not use staples, paper clips, glue or correction fluid.
You may use an HB pencil for any diagrams or graphs.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** the questions.
CALCULATORS MUST NOT BE USED IN THIS PAPER.
All answers should be given in their simplest form.
You must show all the relevant working to gain full marks and you will be given marks for correct methods 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 40.

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

DC (LK/AR) 115879/3

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Formula List

For the equation $ax^2 + bx + c = 0$ $\quad x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Curved surface area, A, of cylinder of radius r, height h. $\quad A = 2\pi rh$

Curved surface area, A, of cone of radius r, sloping edge l. $\quad A = \pi rl$

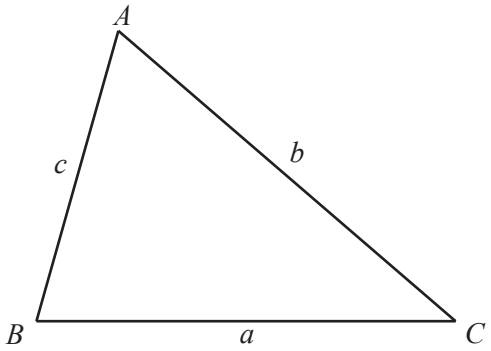
Curved surface area, A, of sphere of radius r. $\quad A = 4\pi r^2$

Volume, V, of pyramid, base area A, height h. $\quad V = \frac{1}{3}Ah$

Volume, V, of cylinder of radius r, height h. $\quad V = \pi r^2 h$

Volume, V, of cone of radius r, height h. $\quad V = \frac{1}{3}\pi r^2 h$

Volume, V, of sphere of radius r. $\quad V = \frac{4}{3}\pi r^3$



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc\cos A$$

$$\text{Area} = \frac{1}{2}bc\sin A$$

Answer **all** the questions.

1 Work out.

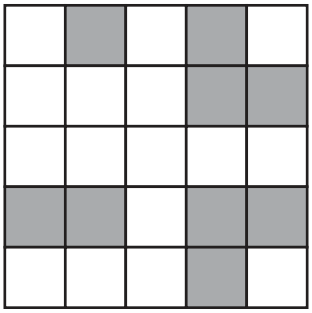
(a) $\frac{8}{0.04}$

..... [1]

(b) $\frac{4}{5} - \frac{1}{4}$

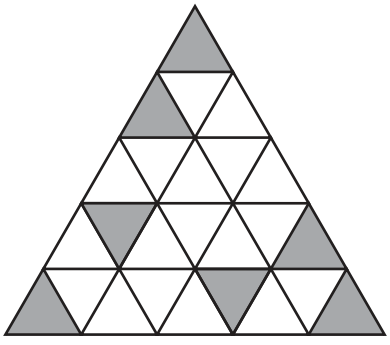
..... [2]

2 **(a)** Shade two more squares so that this shape has exactly one line of symmetry.



[1]

(b) Shade two more triangles so that this shape has rotational symmetry of order 3.



[1]

3 By rounding each number to 1 significant figure, estimate the value of this calculation.
Show all your working.

$$\frac{11.37 \times 289}{52.3 + 99.6}$$

..... [2]

4 $a = 2^5 \times 3^2 \times 7^3$ $b = 2^3 \times 3^4 \times 5$

Leaving your answer as the product of prime factors, find

(a) b^2,

..... [1]

(b) the highest common factor (HCF) of a and b,

.

..... [1]

(c) the lowest common multiple (LCM) of a and b.

..... [2]

5 Luis has a large jar containing red, yellow, green and blue beads.
He takes a bead at random from the jar, notes its colour and replaces it.
He repeats this 200 times.

The table shows his results.

Colour	Red	Yellow	Green	Blue
Number of beads	26	72	64	38
Relative frequency				

(a) Complete the table to show the relative frequencies. [2]

(b) **(i)** There are 5000 beads in the jar altogether.

Estimate the number of green beads in the jar.

..... [1]

(ii) Explain why this is a good estimate.

.....

..... [1]

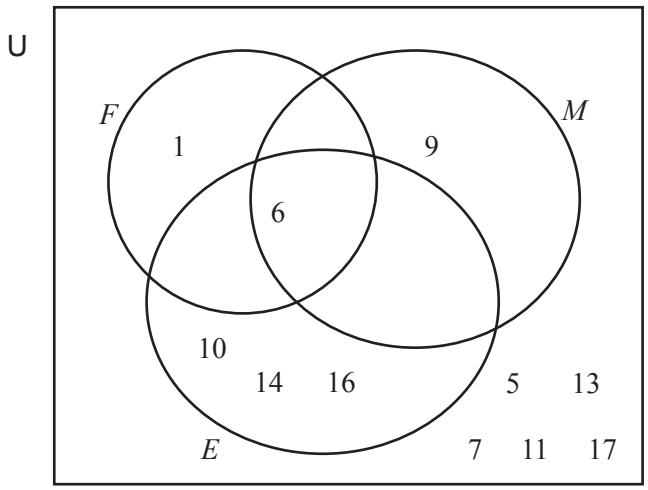
6 Solve.

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

..... [3]

7 U = {Integers from 1 to 18}
F = {Factors of 12}
M = {Multiples of 3}
E = {Even numbers}

(a) Complete the Venn diagram by putting the numbers 2, 3, 4, 8, 12, 15 and 18 in the correct subsets.



[2]

(b) List the members of

(i) $(E \cup F \cup M)'$,

..... [1]

(ii) $E \cap M' \cap F'$.

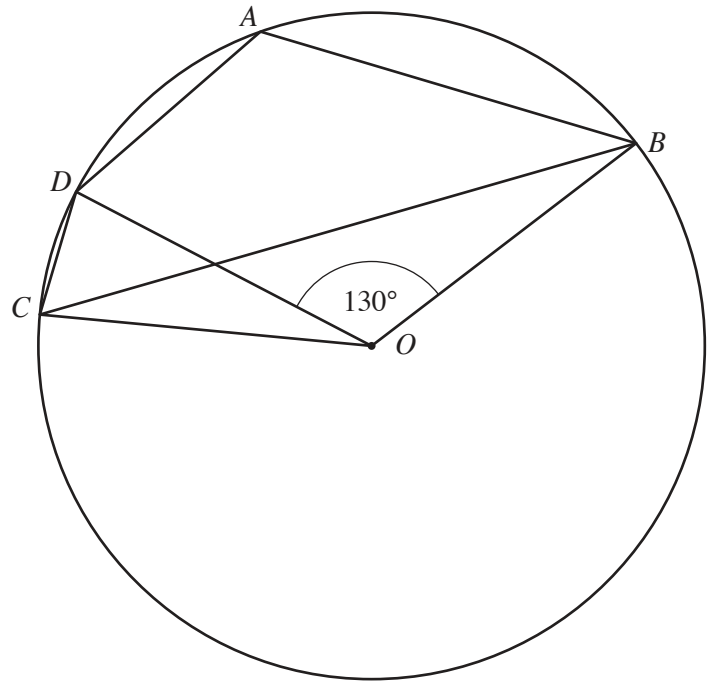
..... [1]

8 Solve.

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

..... [3]

9



NOT TO SCALE

A, B, C and D are points on the circle centre O.
Angle $BOD = 130°$.

(a) Find angle DCB.

Angle DCB = ... [1]

(b) Find angle BAD.

Angle BAD = ... [1]

[Turn over

10 Factorise completely.

(a) $12x^2 - 27xy$

..... [2]

(b) $4a^2 + 8ab - ac - 2bc$

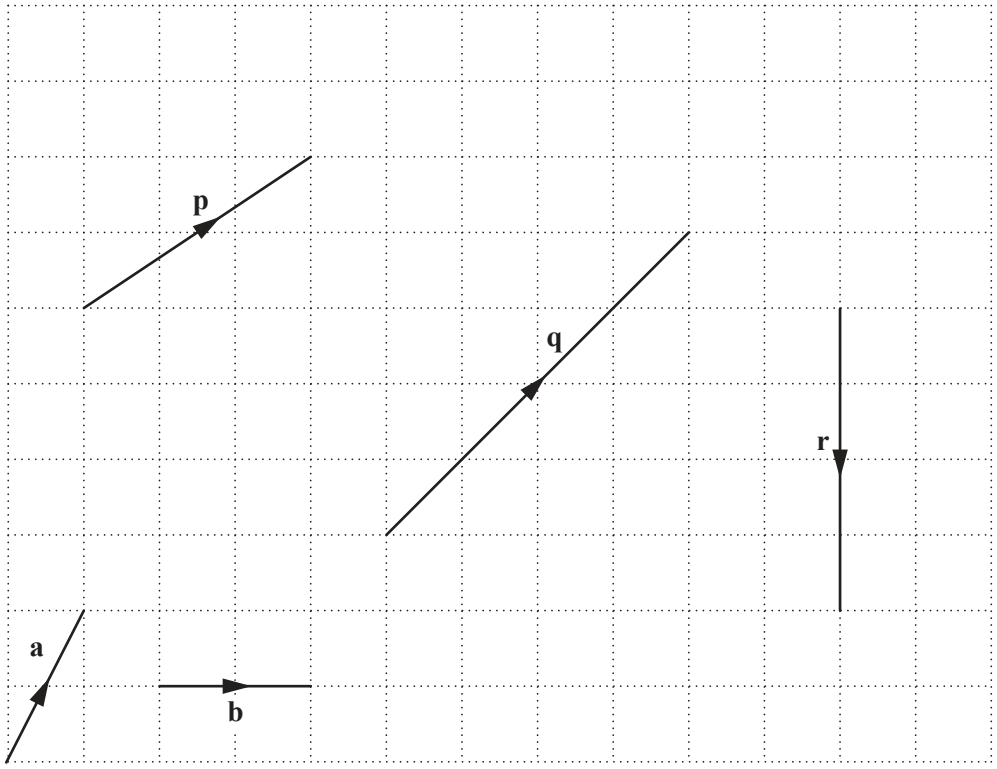
..... [2]

11 Rationalise the denominator.

$$\frac{1}{\sqrt{7}}$$

..... [1]

12



Write the vectors **p**, **q** and **r** in terms of **a** and **b** .

p = ...

q = ...

r = ... [3]

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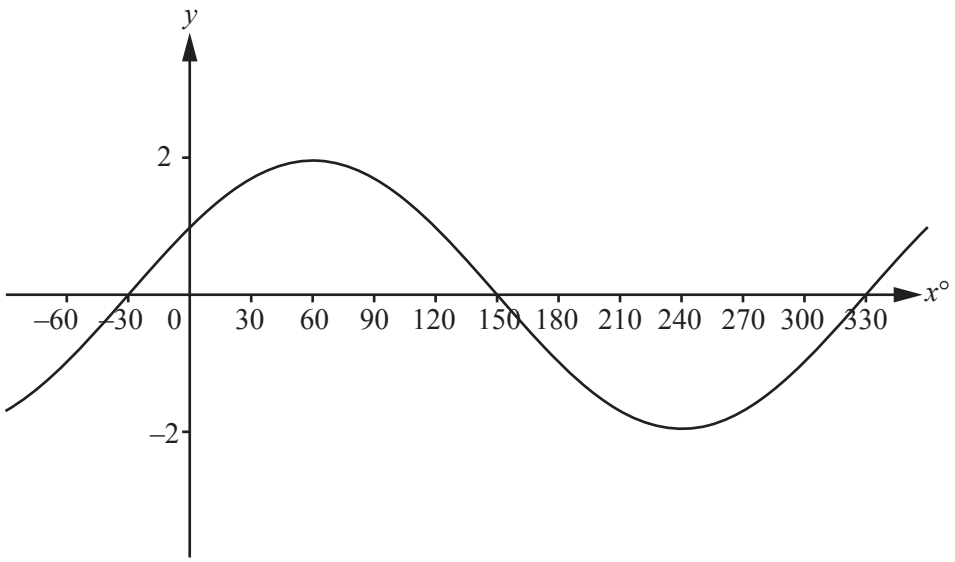
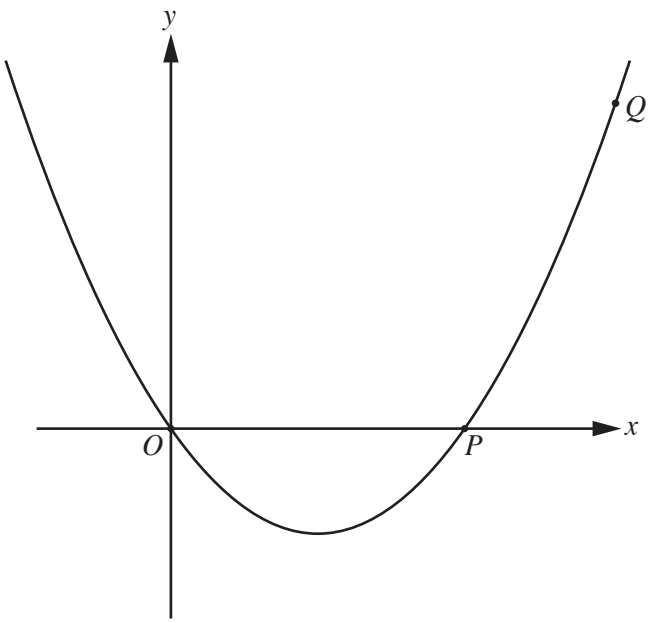


The graph of $y = a\sin(x + b)°$ is shown in the diagram.
Find the value of a and the value of b.

a = ...

b = ... [2]

14



The diagram shows a sketch of the graph of $y = ax^2 + bx$.
O is the point (0, 0), P is the point (4, 0) and Q is the point (8, 96).

Find the value of a and the value of b.

a = ...

b = ... [3]

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