UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

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CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/02**

Paper 2 (Extended) **May/June 2010**

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, 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.
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.

For Examiner's Use

This document consists of **10** printed pages and **2** blank pages.

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. $\quad A = \pi rl$

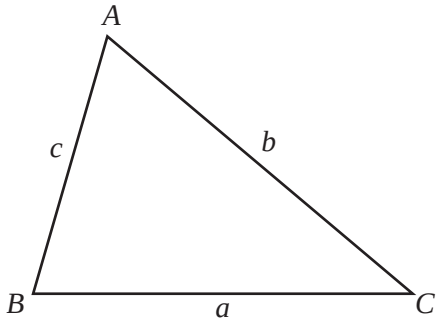
Curved surface area, A, of sphere of radius r. $\quad A = 4\pi r^2$

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

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

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

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



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

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

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

Answer **all** the questions.

1 Write 36 000 in standard form.

Answer ..... [1]

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2 **(a)** Find the value of

(i) 3^0,

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

(ii) $36^{\frac{1}{2}}$.

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

(b) $2^8 \div 2 = 2^x$

Find the value of x.

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

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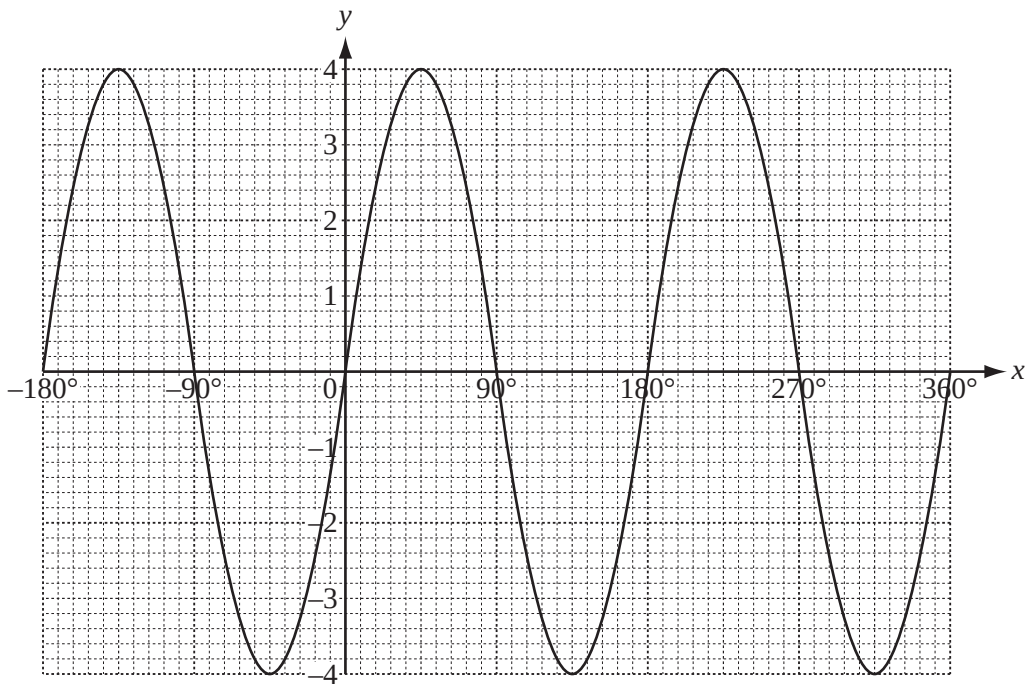
3 Factorise **completely** $3x^2y - 12y^3$.

Answer ..... [2]

4



The diagram shows the graph of $y = f(x)$, where $f(x) = a\sin(bx)$.

Find the values of a and b.

Answer a = ... [1]

Answer b = ... [1]

5 **(a)** Factorise $2x^2 + x - 6$.

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

(b) Solve the equation.

$$2x^2 = 6 - x$$

Answer(b) $x =$ ..... or $x =$ ..... [2]

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6 **(a)** $3\log 2 + 2\log 3 = \log k$

Find the value of k.

Answer(a) $k =$ ..... [2]

(b) Find the value of $\dfrac{\log 25}{\log 5}$.

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

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7 $\mathbf{p} = \begin{pmatrix} 5 \\ 1 \end{pmatrix}$ and $\mathbf{q} = \begin{pmatrix} -4 \\ 2 \end{pmatrix}$

(a) Write $2\mathbf{p} - \frac{1}{2}\mathbf{q}$ as a column vector.

Answer(a) $\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [2]

(b) Find $|\mathbf{q}|$ leaving your answer in surd form.

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

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8 **(a)** Simplify $\sqrt{72} - \sqrt{50}$.

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

(b) Write $\frac{1}{2-\sqrt{3}}$ in its simplest form by rationalising the denominator.

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

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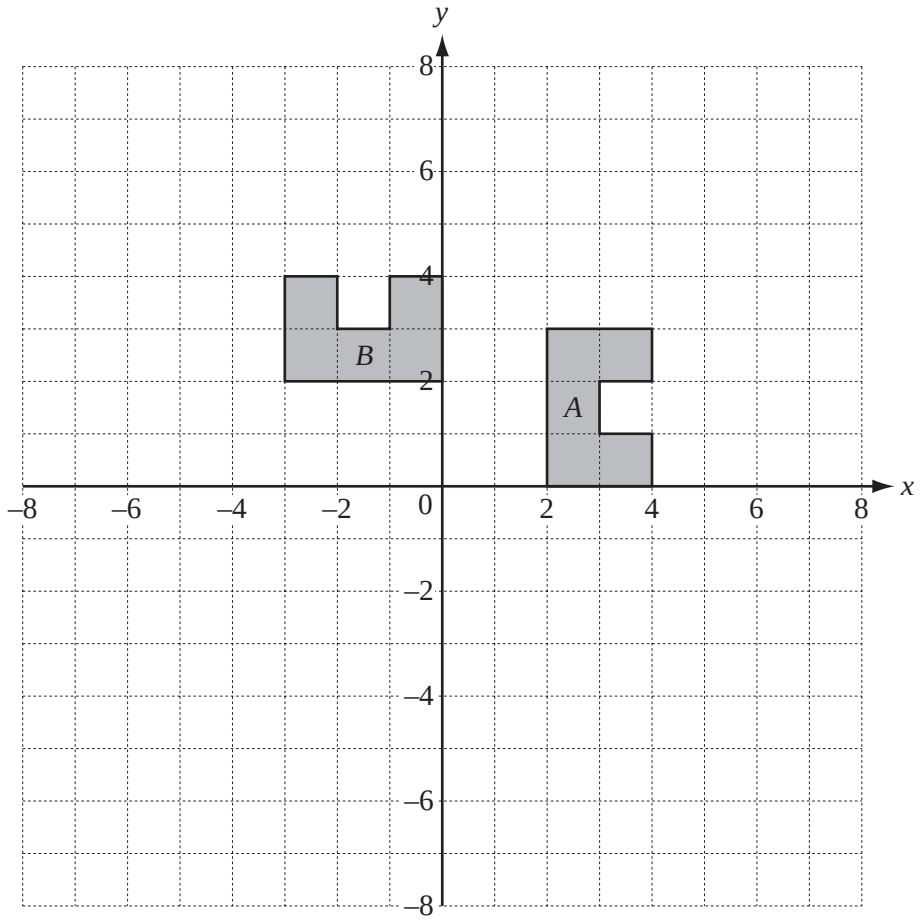

(a) Describe fully the **single** transformation which maps shape *A* onto shape *B*.

.....

..... [3]

(b) Draw the image of shape *A* after a stretch, with *y*-axis invariant and scale factor 2. [2]

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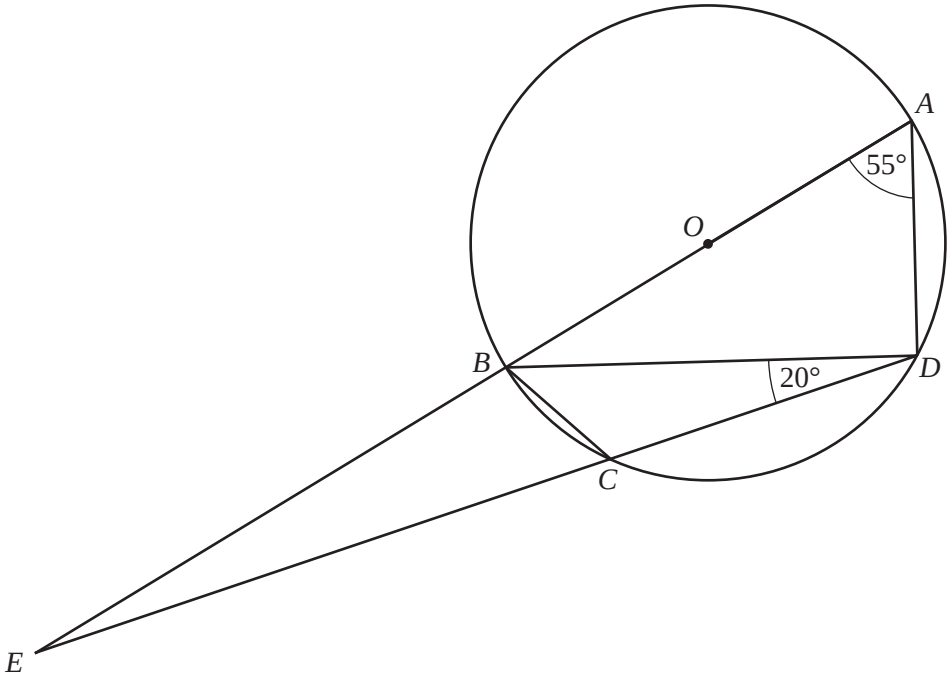
NOT TO SCALE



The points A, B, C and D lie on a circle, centre O.
AB is a diameter, angle $BAD = 55°$ and angle $BDC = 20°$.
ABE and DCE are straight lines.

Find

(a) angle ABD,

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

(b) angle BCD,

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

(c) angle AED.

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

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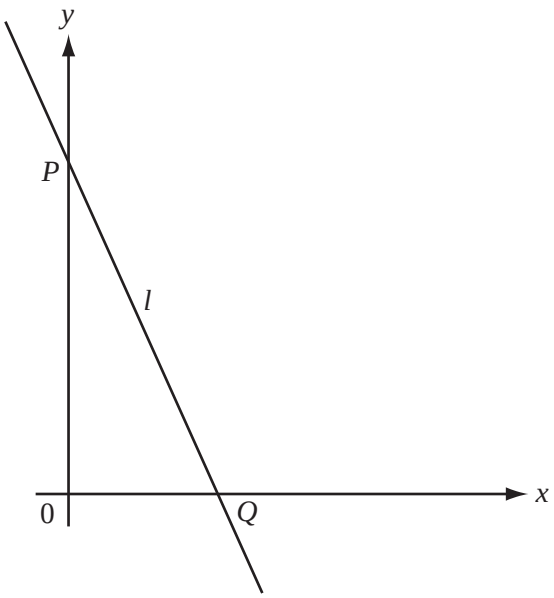

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SCALE

The diagram shows a line, *l,* which passes through the points $P(0, 4)$ and $Q(2, 0)$.

(a) Find the equation of the line *l*.

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

(b) Find the equation of the line which is perpendicular to *l* and passes through the midpoint of *PQ*.

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

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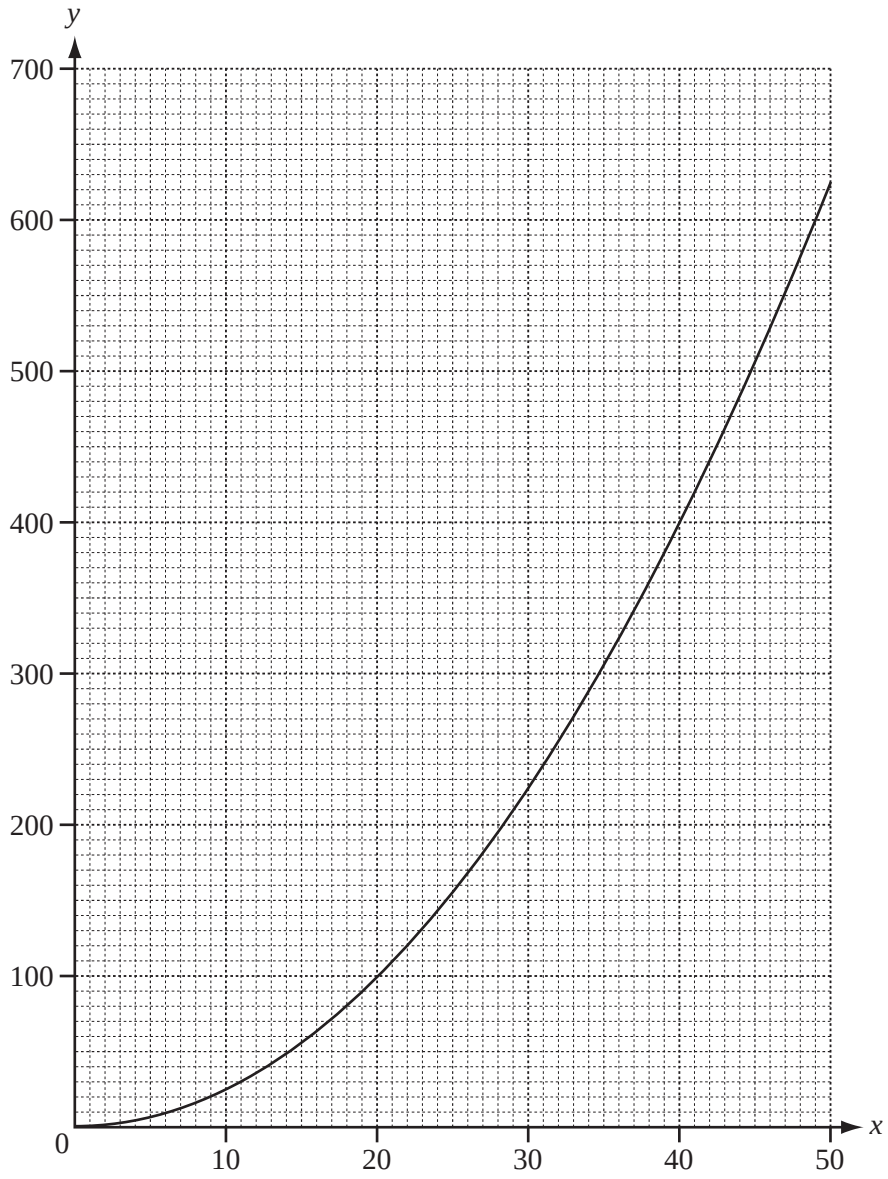

The graph shows the result of an experiment measuring x and y.
It is known that y is directly proportional to the **square** of x.

Find the equation connecting y and x.

Answer ..... [3]

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