Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

9522292004

MATHEMATICS **0580/22**

Paper 2 (Extended) **May/June 2014**

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.

1 Calculate $\frac{\sqrt[3]{16}}{1.3^2}$.

Answer ..... [1]

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2 **(a)** Write 569 000 correct to 2 significant figures.

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

(b) Write 569 000 in standard form.

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

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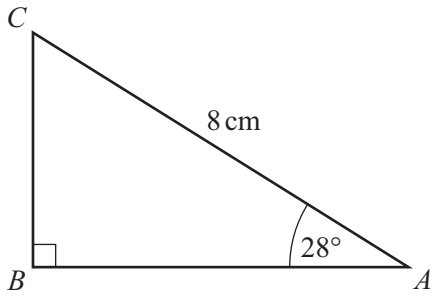
3 Solve the simultaneous equations.

$$2x - y = 7$$
$$3x + y = 3$$

Answer x = ...

y = ... [2]

4

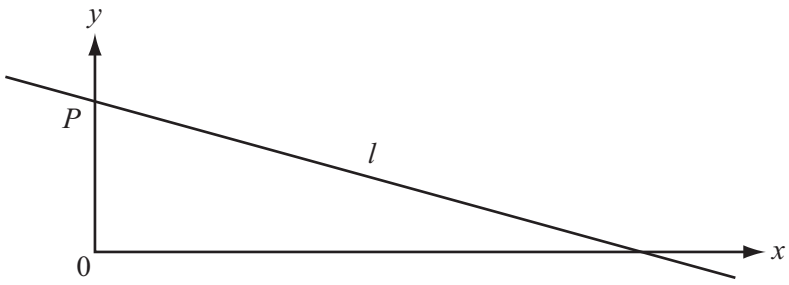


NOT TO SCALE

Calculate the length of AB.

Answer AB = ... cm [2]

5



NOT TO SCALE

The equation of the line l in the diagram is $y = 5 - x$.

(a) The line cuts the y-axis at P.

Write down the co-ordinates of P.

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

(b) Write down the gradient of the line l.

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

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6 The mass of $1\,\text{cm}^3$ of copper is 8.5 grams, correct to 1 decimal place.

Complete the statement about the total mass, T grams, of $12\,\text{cm}^3$ of copper.

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

---

7 Write the following in order, smallest first.

$\sqrt{0.1}$ $\quad\frac{43}{201}$ $\quad 2\frac{1}{2}\%$ $\quad 0.2$

Answer ..... $<$ ..... $<$ ..... $<$ ..... [2]

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8 Without using your calculator, work out $\frac{5}{6} - \left(\frac{1}{2} \times 1\frac{1}{2}\right)$.

Write down all the steps of your working.

Answer ..... [3]

---

9 At the beginning of July, Kim had a mass of 63 kg.
At the end of July, his mass was 61 kg.

Calculate the percentage loss in Kim's mass.

Answer ..... % [3]

---

10 $V = \frac{1}{3}Ah$

(a) Find V when $A = 15$ and $h = 7$.

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

(b) Make h the subject of the formula.

Answer(b) $h =$ ..... [2]

---

11 Anita buys a computer for $391 in a sale.
The sale price is 15% less than the original price.

Calculate the original price of the computer.

Answer $ ..... [3]

---

12 Solve the equation.

$$\frac{3}{2x} + \frac{1}{x+1} = 0$$

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

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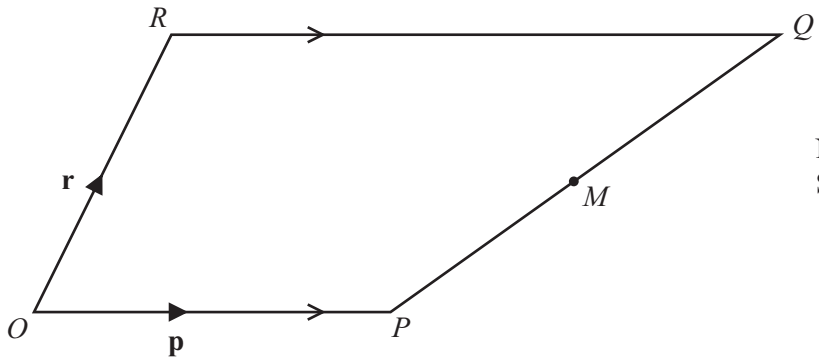
13 w varies inversely as the square root of x.
When $x = 4$, $w = 4$.

Find w when $x = 25$.

Answer $w =$ ..... [3]

14



NOT TO SCALE

$OPQR$ is a trapezium with RQ parallel to OP and $RQ = 2OP$.
O is the origin, $\overrightarrow{OP} = \mathbf{p}$ and $\overrightarrow{OR} = \mathbf{r}$.
M is the midpoint of PQ.

Find, in terms of **p** and **r**, in its simplest form

(a) $\overrightarrow{PQ}$,

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

(b) $\overrightarrow{OM}$, the position vector of M.

Answer(b) $\overrightarrow{OM} =$ ..... [2]

---

15 $\mathbf{M} = \begin{pmatrix} 4 & 2 \\ 3 & 5 \end{pmatrix}$

Find

(a) $\mathbf{M}^2$,

Answer(a) [2]

(b) the determinant of **M**.

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

---

16 Factorise completely.

(a) $4p^2q - 6pq^2$

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

(b) $u + 4t + ux + 4tx$

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

---

17 **(a)** Simplify $(3125t^{125})^{\frac{1}{5}}$.

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

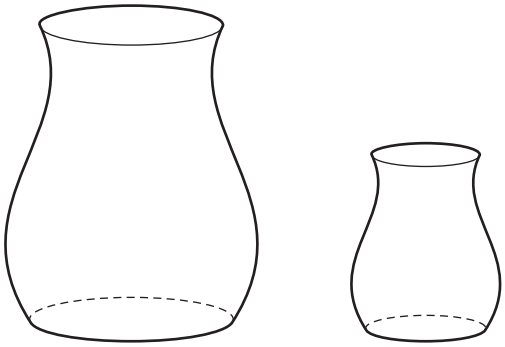
(b) Find the value of p when $3^p = \frac{1}{9}$.

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

(c) Find the value of w when $x^{72} \div x^w = x^8$.

Answer(c) $w =$ ..... [1]

18



NOT TO SCALE

The two containers are mathematically similar in shape.
The larger container has a volume of 3456 cm^3 and a surface area of 1024 cm^2.
The smaller container has a volume of 1458 cm^3.

Calculate the surface area of the smaller container.

Answer ..... cm^2 [4]

---

19 Simplify.

$$\frac{x^2 + 6x - 7}{3x + 21}$$

Answer ..... [4]

---

20 32 25 18 11 4

These are the first 5 terms of a sequence.

Find

(a) the 6th term,

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

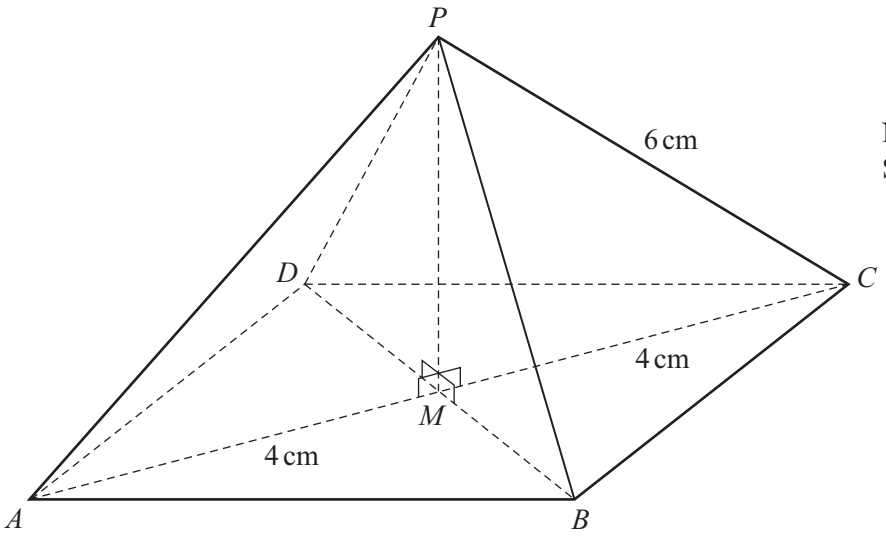
(b) the nth term,

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

(c) which term is equal to –332.

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

21



The diagram shows a pyramid on a square base *ABCD* with diagonals, *AC* and *BD*, of length 8 cm.
AC and *BD* meet at *M* and the vertex, *P*, of the pyramid is vertically above *M*.
The sloping edges of the pyramid are of length 6 cm.

Calculate

(a) the perpendicular height, *PM*, of the pyramid,

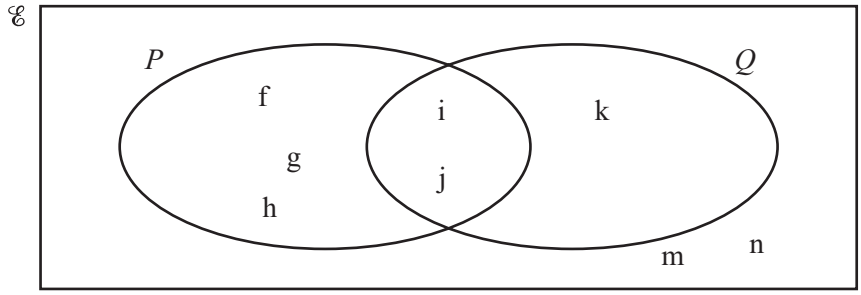
Answer(a) PM = ... cm [3]

(b) the angle between a sloping edge and the base of the pyramid.

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

Question 22 is printed on the next page.

22



(a) Use the information in the Venn diagram to complete the following.

(i) $P \cap Q = \{.....\}$ [1]

(ii) $P' \cup Q = \{.....\}$ [1]

(iii) $n(P \cup Q)' =$ ..... [1]

(b) A letter is chosen at random from the set Q.

Find the probability that it is also in the set P.

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

(c) On the Venn diagram shade the region $P' \cap Q$. [1]

(d) Use a set notation symbol to complete the statement.

{f, g, h} ..... P

[1]