UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

* 2 9 0 1 5 3 4 1 2 7 *

MATHEMATICS **0580/32**

Paper 3 (Core) **May/June 2012**

2 hours

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
Mathematical tables (optional)
Geometrical instruments
Tracing paper (optional)

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 a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, 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 104.

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

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1 **(a)** Indira buys 1250 square metres of land to build a hotel.
Each square metre of land costs \$12.

Calculate the cost of the land.

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

(b) The cost of the land is 3% of the cost of the hotel.

Calculate the cost of the hotel.

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

(c) The hotel has 84 rooms.
The types of room are in the ratio family : double : single = 3 : 5 : 4.

Calculate the number of double rooms.

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

(d) Each single room is a cuboid, 4.5 m long, 3.2 m wide and 2.8 m high.

Calculate the volume of a single room.

Answer(d) ..... m^3 [2]

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(e) The total hotel income for the first year was \$992 000.

(i) The hotel spent $\frac{3}{8}$ of the total hotel income on staff wages.

Calculate the staff wages.

Answer(e)(i) \$ ..... [1]

(ii) The hotel also spent \$420 000 on food.

Calculate how much of the total hotel income was left.

Answer(e)(ii) \$ ..... [2]

(iii) Calculate \$420 000 as a percentage of \$992 000.
Give your answer correct to 1 decimal place.

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

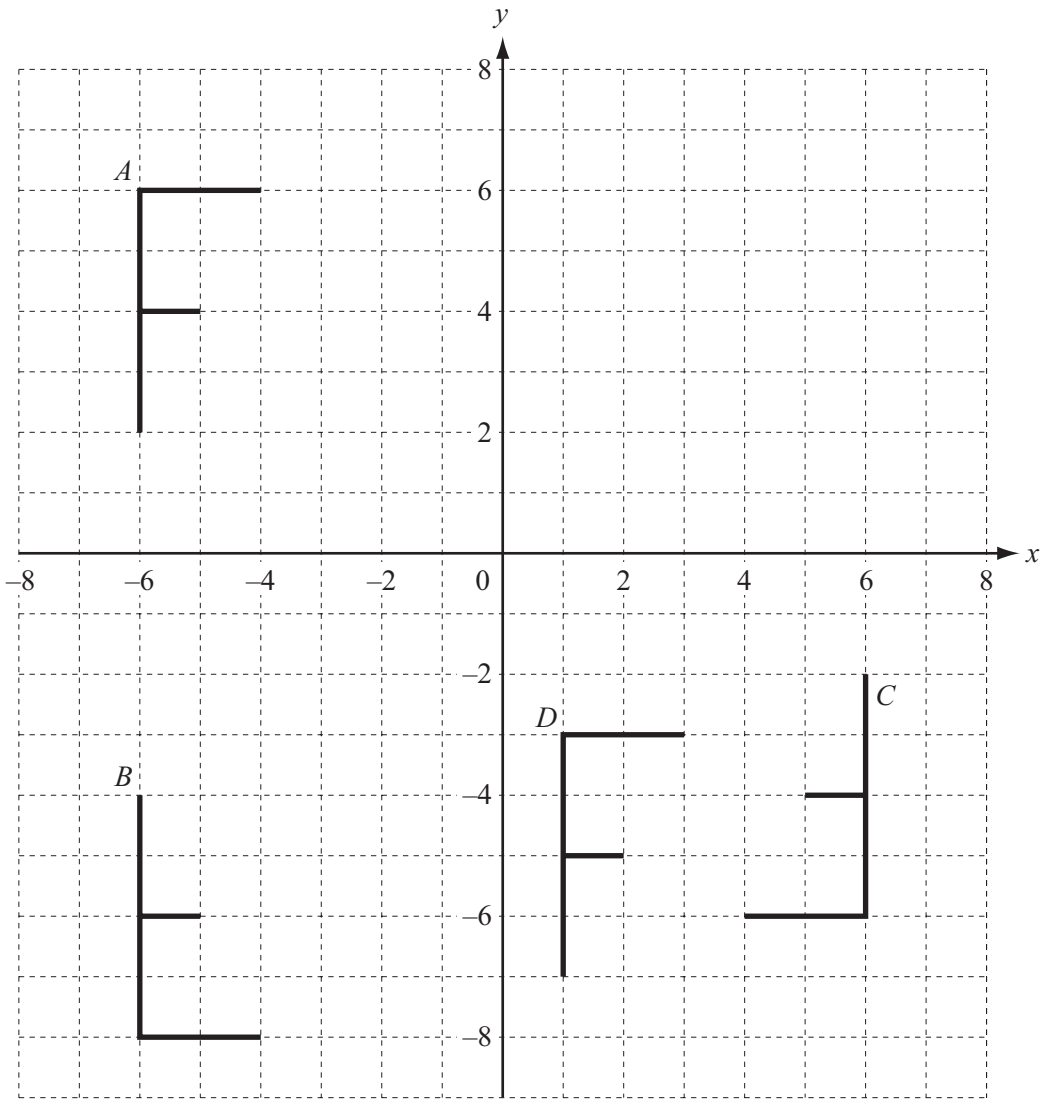
(f) To make improvements, Indira borrows \$3 500 at a rate of 6% per year simple interest.
She pays back all the amount at the end of 3 years.

Calculate the total amount she needs to repay.

Answer(f) \$ ..... [3]

2

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(a) Describe fully the **single** transformation that maps *A* onto

(i) *B*,

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

(ii) *C*,

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

(iii) *D*.

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

(b) On the grid, draw the enlargement of *A*, scale factor $\frac{1}{2}$, centre (0, 0). [2]

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3 **(a)** Calculate

(i) 3^3,

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

(ii) $\frac{12^2}{\sqrt{81}}$,

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

(iii) the cube root of 4913.

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

(b) Find

(i) all the square numbers between 6 and 40,

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

(ii) four factors of 76,

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

(iii) a prime factor of 35,

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

(iv) the lowest common multiple of 6 and 8,

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

(v) the highest common factor of 56 and 70.

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

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4 **(a)** The table shows some values of $y = \frac{10}{x}$.

x	–8	–5	–4	–2	–1		1	2	4	5	8
y	–1.25			–5			10			2	

(i) Complete the table. [2]

(ii) On the grid opposite, draw the graph of $y = \frac{10}{x}$ for $-8 \leqslant x \leqslant -1$ and $1 \leqslant x \leqslant 8$. [4]

(b) **(i)** On the same grid, draw the straight line through the points (−3, −5) and (1, 3). Extend the line to the edges of the grid. [2]

(ii) Find the co-ordinates of the points of intersection of this line with the graph of $y = \frac{10}{x}$.

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

(c) For the line in **part (b)(i)**

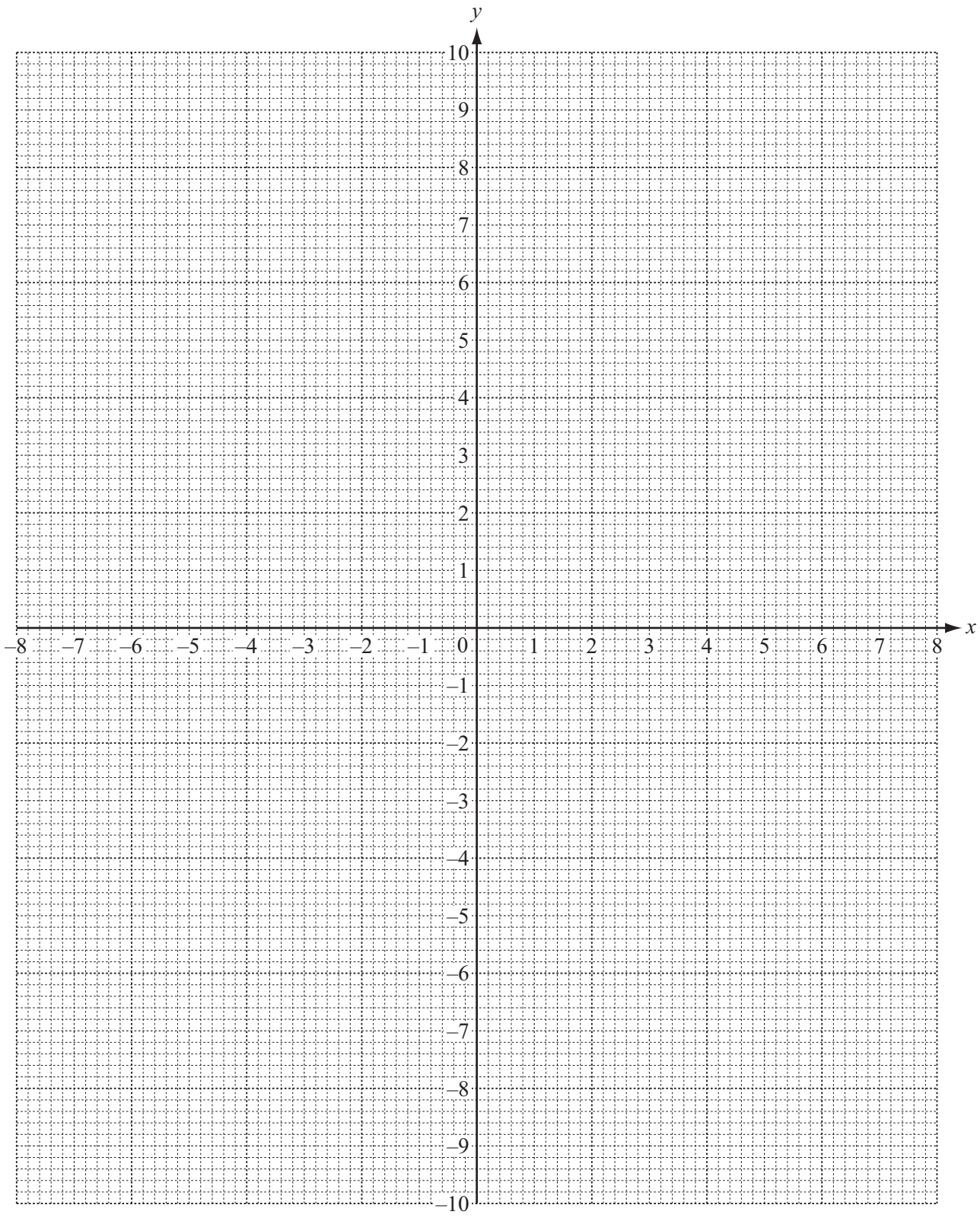
(i) work out the gradient,

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

(ii) write down the equation in the form $y = mx + c$.

Answer(c)(ii) $y =$ ..... [1]

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5 **(a)** $A = \frac{1}{2}(a + b)h$

Work out the value of A when $a = 9.6$, $b = 12.4$ and $h = 7.5$.

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

(b) **(i)** Expand $x(x^2 - 3y)$.

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

(ii) Expand and simplify $4(2w - 3) + 5(w - 2)$.

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

(c) A quadrilateral has sides x, $2x$, y and $3y$.

(i) Write down and simplify a formula for the perimeter, p, of the quadrilateral.

Answer(c)(i) $p =$ ..... [2]

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(ii) Make y the subject of the formula in **part (c)(i)**.

Answer(c)(ii) $y =$ ..... [2]

(d) Joseph is 3 times as old as Amy.
In 5 years time Joseph will be 2 times as old as Amy.

(i) Amy is now n years old.

Write down an equation in n connecting the ages of Joseph and Amy in 5 years time.

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

(ii) Solve the equation to find n.

Answer(d)(ii) $n =$ ..... [3]

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6 The total distance, to the nearest kilometre, travelled by a taxi each day for 24 days is shown below.

100	98	95	98	97	99	96	98
97	98	97	99	100	96	97	99
100	250	97	99	98	95	97	96

(a) (i) Complete the frequency table.
You may use the tally column to help you.

Distance travelled (km)	Tally	Number of days
95		
96		
97		
98		
99		
100		
250		

[2]

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(ii) Write down the mode.

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

(iii) Find the median.

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

(iv) Calculate the mean.

Answer(a)(iv) ..... km [3]

(v) Which of the mean or the median best represents the average distance the taxi travels each day?
Give a reason for your answer.

Answer(a)(v) ..... because .....

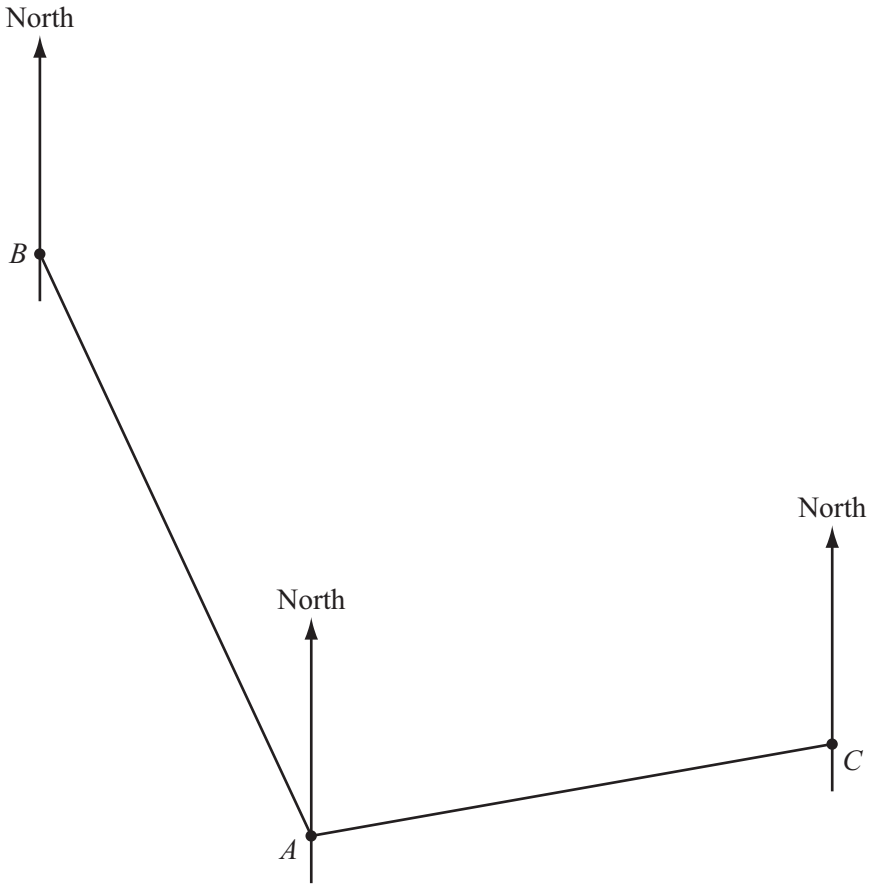
..... [1]

(b) Find the probability that, on a day chosen at random, the taxi travels 98 km or more.

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

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7 The scale drawing shows the positions of three airports A, B and C.
The scale is 1 centimetre represents 100 kilometres.



Scale: 1 cm to 100 km

(a) Measure the bearing of airport A from airport B.

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

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(b) The flight path of an aeroplane is a straight line equidistant from A and from B.

Using a straight edge and compasses only, construct the flight path of this aeroplane. [2]

(c) An aeroplane takes off from airport A and flies on a bearing of 020°.
It crosses the flight path of the aeroplane in **part (b)** at D.

(i) Draw the straight line path of this aeroplane and mark the point D. [1]

(ii) Write down the actual distance from A to D.

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

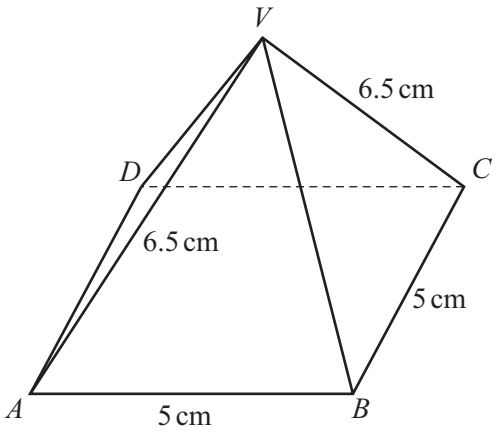
(d) An aeroplane takes off from airport C.
It flies a distance of 1230 km in 2 hours 45 minutes.

Calculate the average speed of the aeroplane.

Answer(d) ..... km/h [2]

8

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NOT TO SCALE

The diagram shows a pyramid, $ABCDV$, on a square base.
All the sloping faces are congruent triangles.
$AB = 5$ cm and $VA = 6.5$ cm.

(a) Write down the mathematical name of triangle VAB.

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

(b) (i) **Using a ruler and compasses only**, construct the triangle VAB.
Show your construction arcs.

[2]

(ii) By making any necessary measurements, calculate the area of triangle VAB.

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

(iii) Calculate the total surface area of the pyramid, including the base.

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

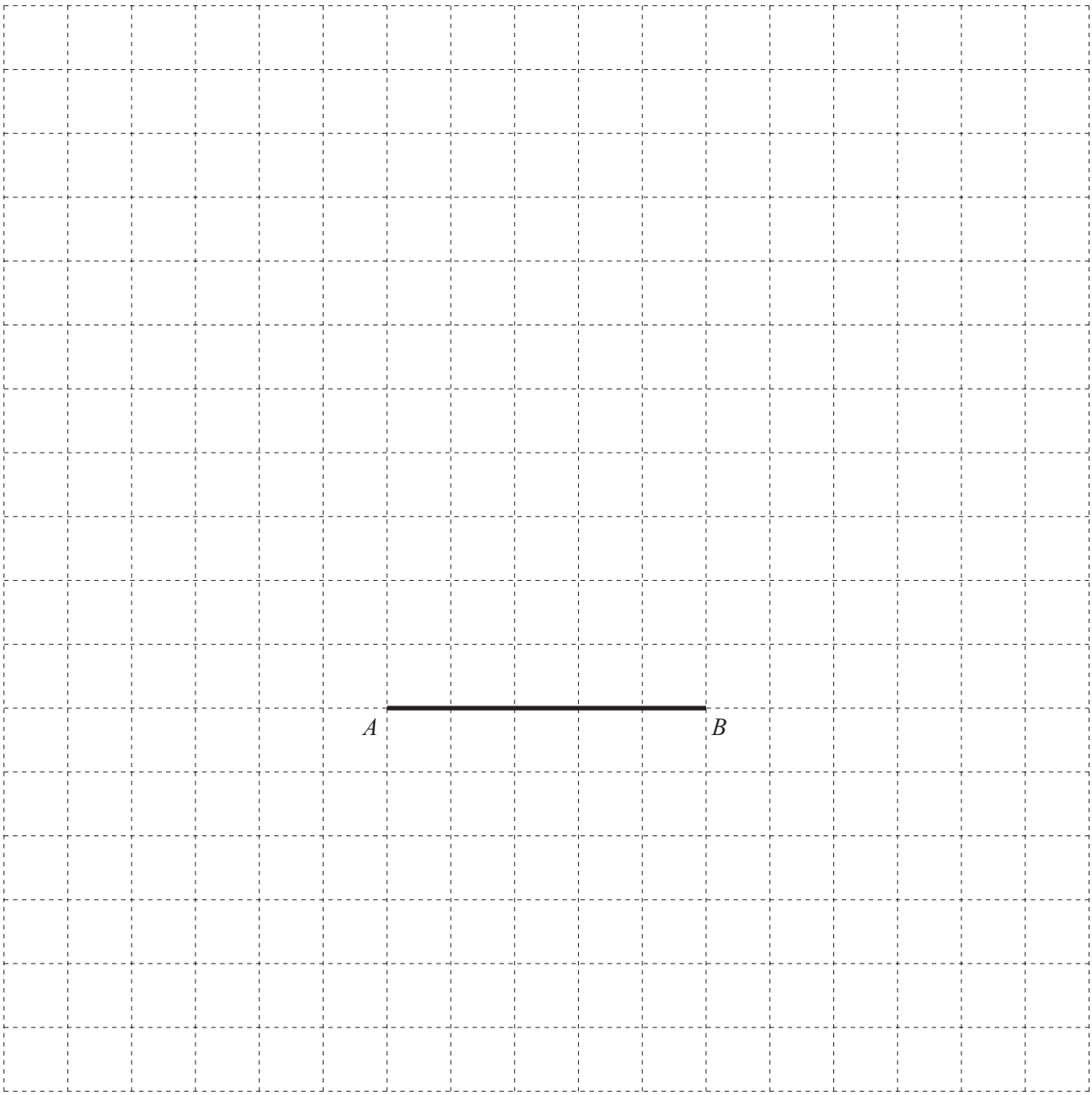
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(iv) Work out the total length of **all** the edges of the pyramid.

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

(c) On the grid, draw an accurate net of the pyramid.
The line *AB* has been drawn.



[3]

Question 9 is printed on the next page.

9

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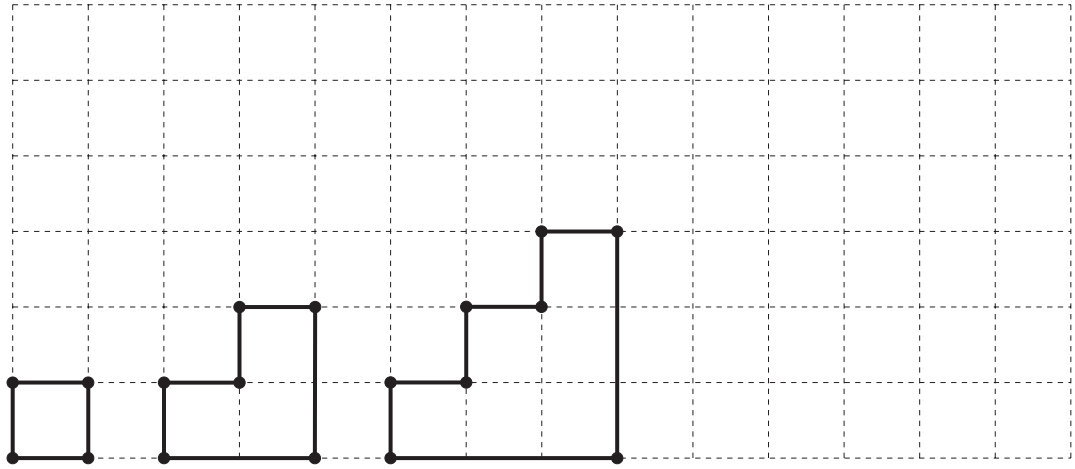


Diagram 1 Diagram 2 Diagram 3 Diagram 4

(a) The pattern of diagrams above forms a sequence.

(i) On the grid, draw Diagram 4. [1]

(ii) Complete the table.

Diagram	1	2	3	4	5
Number of dots	4	6			

[2]

(b) Find the number of dots in Diagram *n*.

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

(c) Find the number of dots in Diagram 48.

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

(d) There are 3 one centimetre squares in Diagram 2.

Find the number of one centimetre squares in Diagram 5.

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

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