WJEC CBAC

GCSE

184/05

MATHEMATICS (3 Tier)
INTERMEDIATE TIERC
PAPER 1

A.M. MONDAY, 19 May 2008

2 hours

CALCULATORS ARE
NOT TO BE USED
FOR THIS PAPER

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Calculators are **not** allowed for this paper.

Take π as 3·14.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	5	
2	6	
3	3	
4	2	
5	7	
6	3	
7	6	
8	2	
9	5	
10	4	
11	6	
12	4	
13	4	
14	3	
15	4	
16	4	
17	4	
18	4	
19	4	
20	7	
21	3	
22	2	
23	4	
24	4	
TOTAL MARK		

Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$
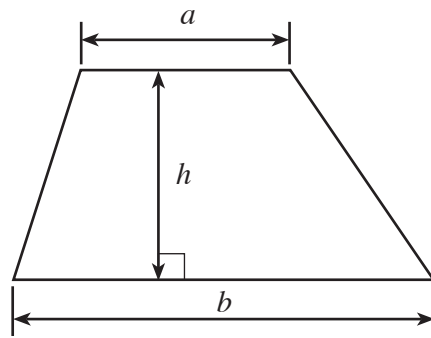
Volume of prism = area of cross-section × length
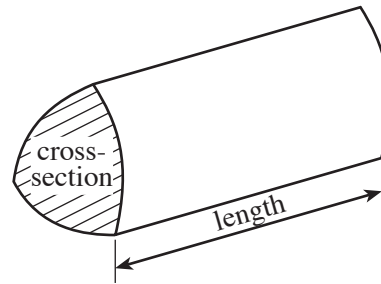
1. *(a)* Find the size of the angle marked *x*.

....

....
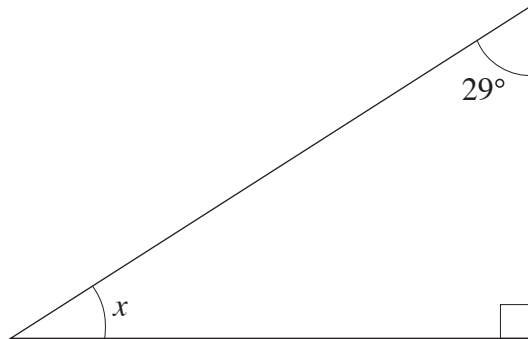
$x =$ .... °

[2]

(b) Find the size of the angle marked *y*.

....

....

....

....

$y =$ .... °

[3]

Turn over.
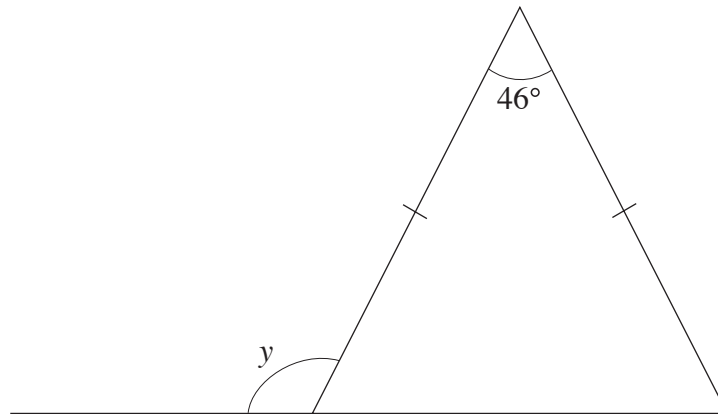
2. *(a)* Write down 0·0381 correct to 2 significant figures.

....
[1]

(b) Write down 479·8874 correct to 3 significant figures.

....
[1]

(c) Find the value of $2^3 \times 3^2$.

....

....

....

....
[2]

(d) Find the value of $\dfrac{8}{9} - \dfrac{2}{3}$.

....

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....

....

....
[2]

3. Showing all your working, find which of the quantities $\frac{9}{20}$, 42% and 0·46 is (i) the smallest, (ii) the largest.

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....

....

....

....

....

   (i)   Smallest = ... (ii)   Largest = ...

[3]

4. Clearly showing how you obtained your answer, ESTIMATE the value of:

$$\frac{87 \times 248}{52}$$

....

....

....

[2]

Turn over.

5. In a game a player rolls a coin onto a squared board. The squares on the board are coloured red, blue, green or yellow. If the coin lands entirely within one of these coloured squares the player wins a prize, otherwise the player loses.
The table below shows the probabilities of the coin landing entirely within the coloured squares.

Colour	Red	Blue	Green	Yellow	Player loses
Probability	0·15	0·09	0·05	0·06	0·65

(a) (i) What is the probability that a player's coin lands entirely within a red square or a blue square?

....

....

....

(ii) What is the probability that a player wins a prize?

....

....

....

[3]

(b) One day 200 people play this game. Approximately how many would you expect to win a prize?

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[2]

(c) It costs 80p to play the game once. The prize for winning is £2. If the 200 people play the game once, approximately how much profit do you expect the game to make?
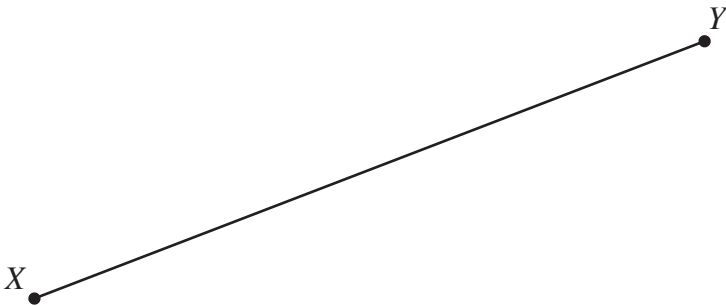
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[2]

6. The diagram shows two points *X* and *Y* on a map. Use the scale of the map to find the **actual** distance, *XY*, in metres. [3]

Scale: 1cm represents 40m

Y

X

....

....

....

Actual length of *XY* = ... metres

Turn over.

7. CDs are available in two different sized boxes. Small boxes contain 5 CDs and large boxes contain 10 CDs.

Enid has x small boxes each containing 5 CDs.

(a) Write down, in terms of x, the total number of CDs in these small boxes.

....
[1]

(b) The number of large boxes that Enid has is 3 less than the number of small boxes that she has. Write down, in terms of x, the number of large boxes she has.

....
[1]

(c) Write down, in terms of x, the total number of CDs in the large boxes.

....
[1]

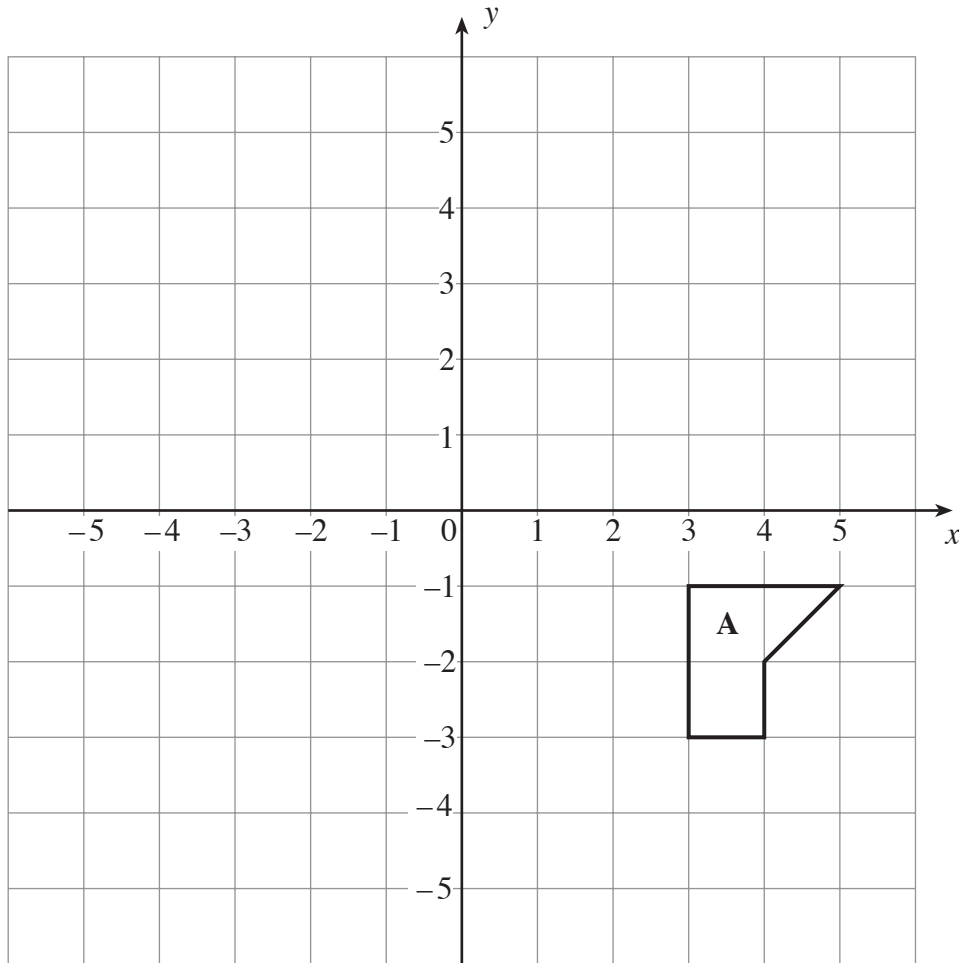*(d)* Write down, in terms of x, the total number of CDs altogether. You must simplify your answer as far as possible.

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....

....

....
[3]

8. Reflect the shape marked **A** in the line $x = 1$. [2]

9. *(a)* Find 240 as a percentage of 600.

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[2]

(b) A recipe for making 12 pancakes includes the following ingredients.

110g flour
2 large eggs
200ml milk

Calculate the quantities of these ingredients needed to make 30 pancakes.

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....

[3]

Turn over.

10. In the diagram below, *AB* and *AC* are two straight lines meeting at *A*. Two parallel lines *PQ* and *RS* cut *AB* and *AC* at *D, E, F* and *G* as shown. Angles of 57°, 116° and *x* are as shown.
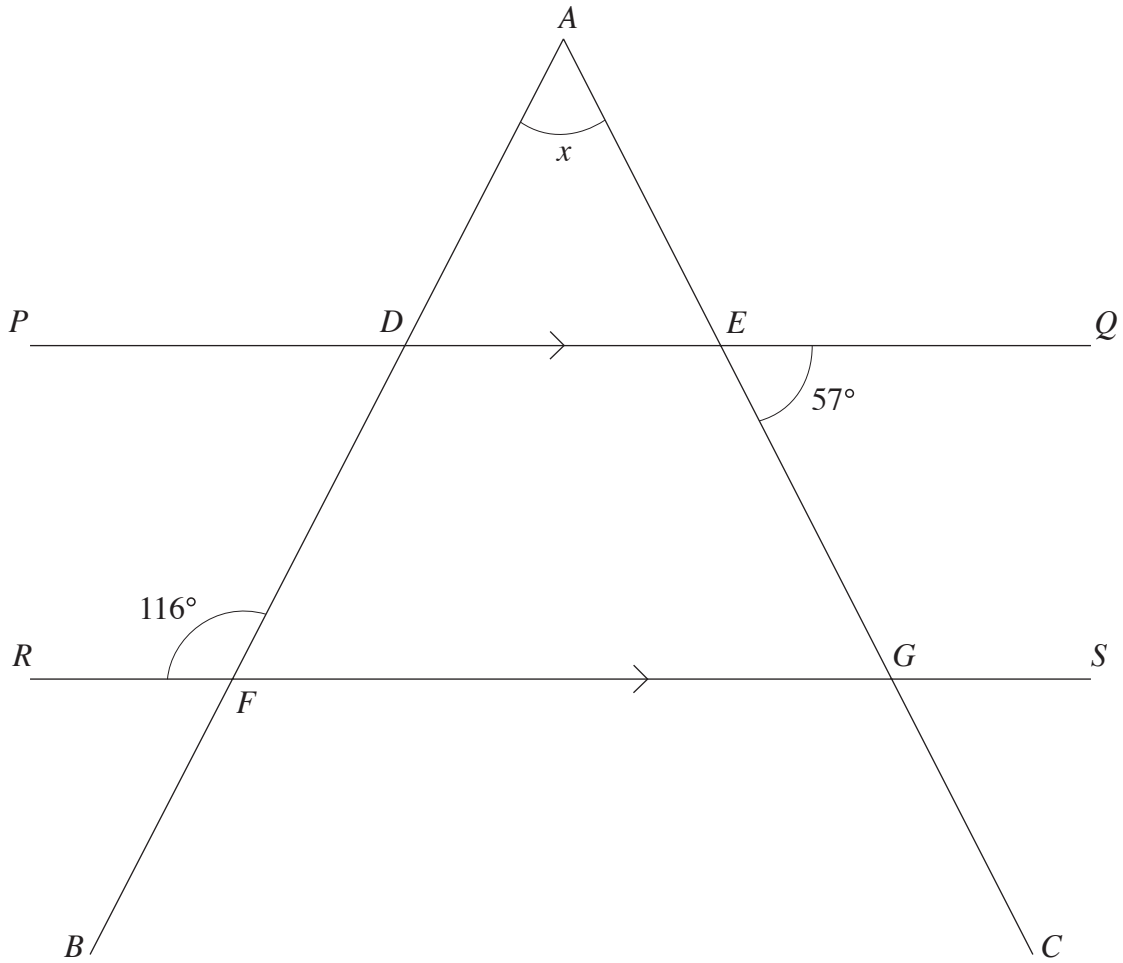
Diagram not drawn to scale.

Find the size of the angle marked *x*.

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[4]

11. *(a)* Solve the equation

$$5 + 7x = 29 + 3x.$$

[3]

(b) Simplify $y^8 \times y^2$.

[1]

(c) Expand and simplify $5(3x + 4) - 2(2x + 7)$.

[2]

12. Write down, in terms of n, the nth term of **each** of the following sequences.

(a) 3   7   11   15   19   ......

[2]

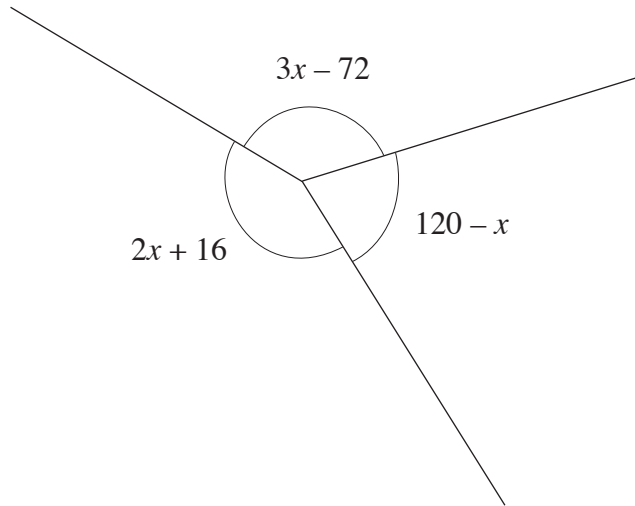*(b)* 1×3 2×4 3×5 4×6 ....

[2]

Turn over.

13. In the diagram below, three lines meet at a point. The sizes of the angles between the lines, measured in degrees, are as shown in the diagram.

$3x - 72$

$120 - x$

$2x + 16$

(a) Write down an equation that x satisfies.

....

....

....

[2]

(b) Solve the equation to find the value of x.

....

....

....

....

....

[2]

14. The number of words in each of 100 sentences in a book was counted. The table shows a grouped frequency distribution of the results.

Number of words (w)	$3 \leqslant w \leqslant 7$	$8 \leqslant w \leqslant 12$	$13 \leqslant w \leqslant 17$	$18 \leqslant w \leqslant 22$	$23 \leqslant w \leqslant 27$
Frequency	13	23	34	18	12

On the graph paper below, draw a frequency polygon to show this data.

[3]

Turn over.
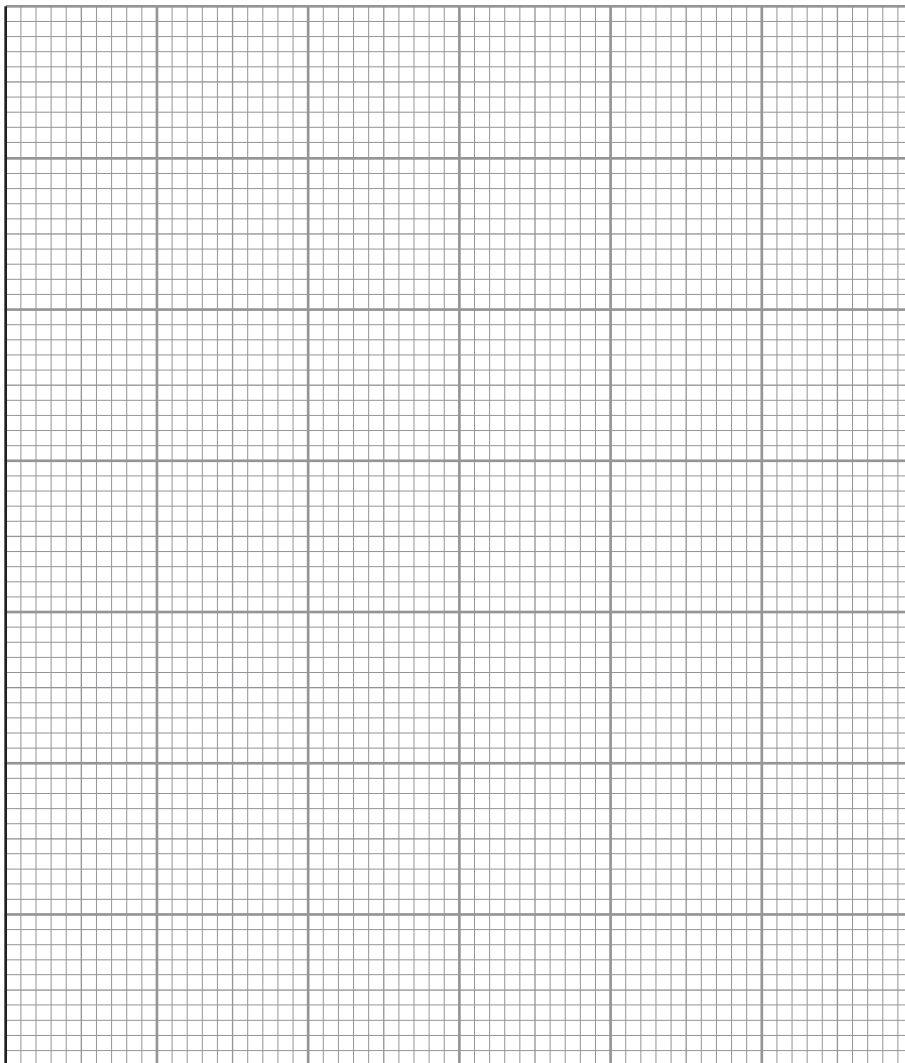
15. *(a)* Express 500 as a product of prime numbers in index form.

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[3]

(b) Write down the least positive whole number that $3^2 \times 7^3$ must be multiplied by to make the result a perfect square.
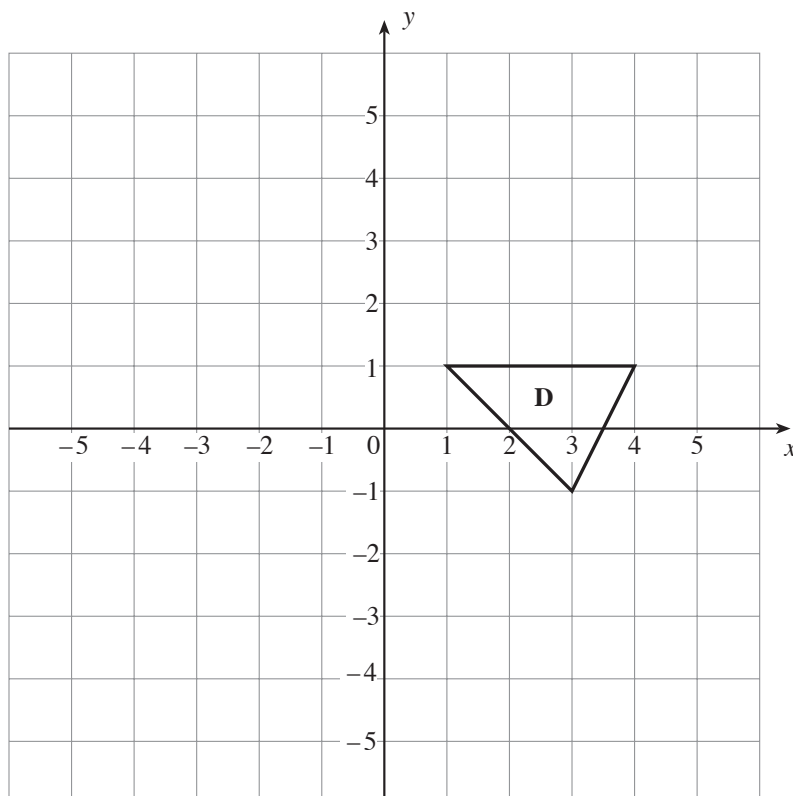
....

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[1]

16. *(a)* Draw the reflection of the triangle *ABC* in the line $y = x$.

[2]
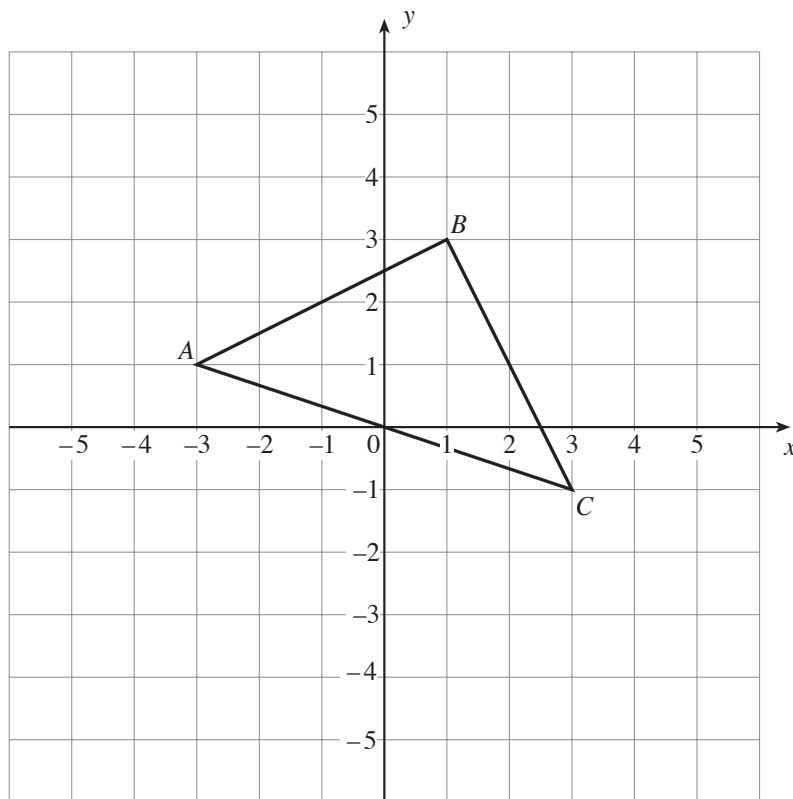
(b) Rotate the triangle **D** through 90° clockwise about the point (−1, 2).
Label the image **E**.

[2]

(184-05)

Turn over.

17. *(a)* The diagram shows a piece of cardboard. It is fixed to a drawing board by a drawing pin at *A*. Draw the locus of the point *B* as the cardboard turns about *A*.

[1]
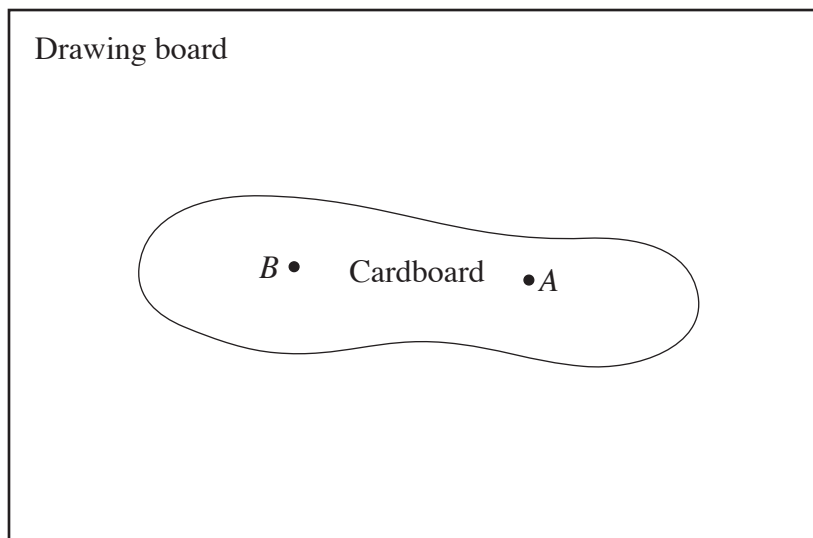
(b) A circular disc, centre *C*, is rolled along level ground from *P* to *Q*. Draw the locus of *C*.

[1]

(c) A circular disc, centre *D*, is rolled along level ground then up a slope. Draw the locus of *D* as the disc is rolled from *X* to *Y*.

[2]