

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCSE

Methods in Mathematics

Unit 2: Methods 2

For Approved Pilot Centres ONLY

Higher Tier

Tuesday 21 June 2011 – Morning

Time: 1 hour 45 minutes

Paper Reference

5MM2H/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed – *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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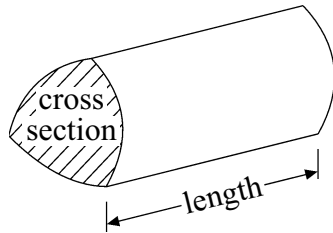
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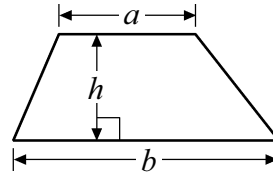
Formulae – Higher Tier

**You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.**

Volume of a prism = area of cross section \times length

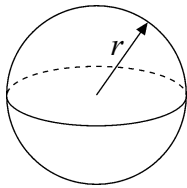


Area of trapezium = $\frac{1}{2}(a + b)h$



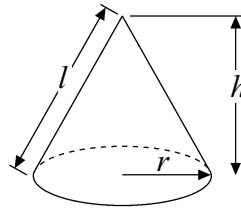
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

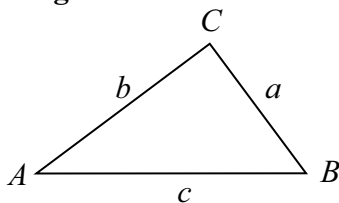


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$

where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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

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

Area of triangle = $\frac{1}{2}ab \sin C$



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

*1

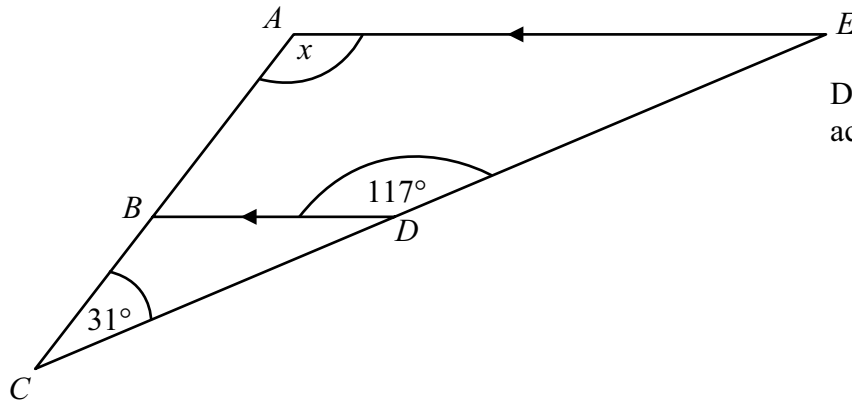


Diagram NOT
accurately drawn

AE is parallel to BD .

ABC and CDE are straight lines.

Work out the size of the angle marked x .

You must give reasons for your answer.

(Total for Question 1 is 5 marks)



2 Divide £168 in the ratio 3 : 5 : 4

£..... £..... £.....

(Total for Question 2 is 3 marks)

3 (a) Write $\frac{17}{80}$ as a decimal.

.....
(1)

(b) Use your calculator to work out $\frac{5.6 \times 1.8}{18.03 - 7.4}$

.....
(2)

(Total for Question 3 is 3 marks)



4 (a) Work out 15% of £600

£
(2)

(b) Decrease £150 by 12%.

£
(2)

(c) Work out 28 as a percentage of 35

..... %
(2)

(Total for Question 4 is 6 marks)



5 The diagram shows a solid prism.

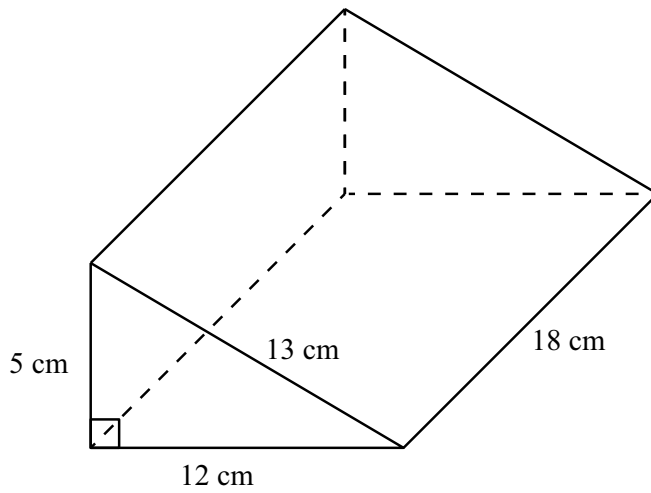


Diagram **NOT** accurately drawn

Work out the total surface area of the prism.

..... cm²

(Total for Question 5 is 3 marks)



6 n is an integer and $-2 < n \leq 3$

(a) Write down all the possible values of n .

.....
(2)

Here is a number line.



(b) Write down the inequality shown on the number line.

.....
(2)

(Total for Question 6 is 4 marks)

7 The formula for the circumference of a circle is $C = \pi d$.

Work out the circumference of a circle of radius 4.7 cm.

Give your answer correct to 1 decimal place.

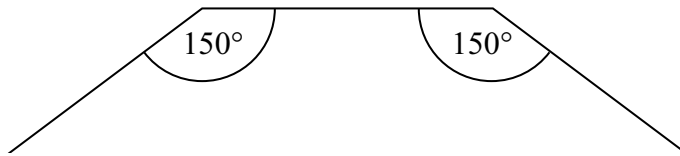
..... cm

(Total for Question 7 is 3 marks)



8 The diagram shows 3 sides of a regular polygon.

Diagram **NOT**
accurately drawn



Each interior angle of the regular polygon is 150° .

Work out the number of sides of the regular polygon.

.....
(Total for Question 8 is 3 marks)

9 The width of a rectangle is a whole number of centimetres.
The length of the rectangle is 9 cm longer than its width.

The perimeter of the rectangle is less than 200 cm.

Find the greatest possible width of the rectangle.

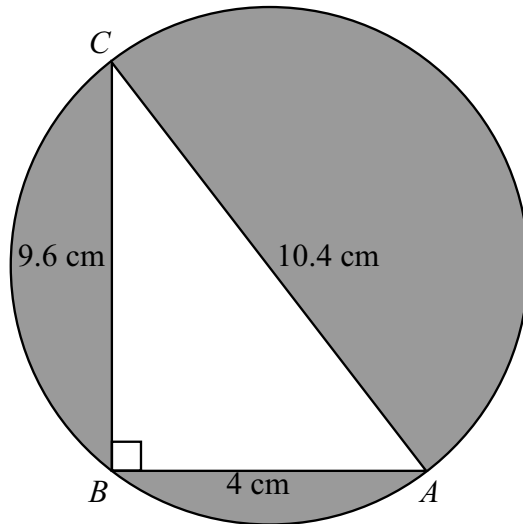
..... cm

(Total for Question 9 is 4 marks)



10

Diagram **NOT**
accurately drawn



AC is a diameter of the circle.
 ABC is a right-angled triangle.

Work out the shaded area.
Give your answer correct to 1 decimal place.

..... cm^2

(Total for Question 10 is 5 marks)



11 (a) Complete the table for $y = x^2 + 2x - 4$

x	-4	-3	-2	-1	0	1	2
y		-1	-4				4

(b) On the grid opposite, draw the graph of $y = x^2 + 2x - 4$

(2)

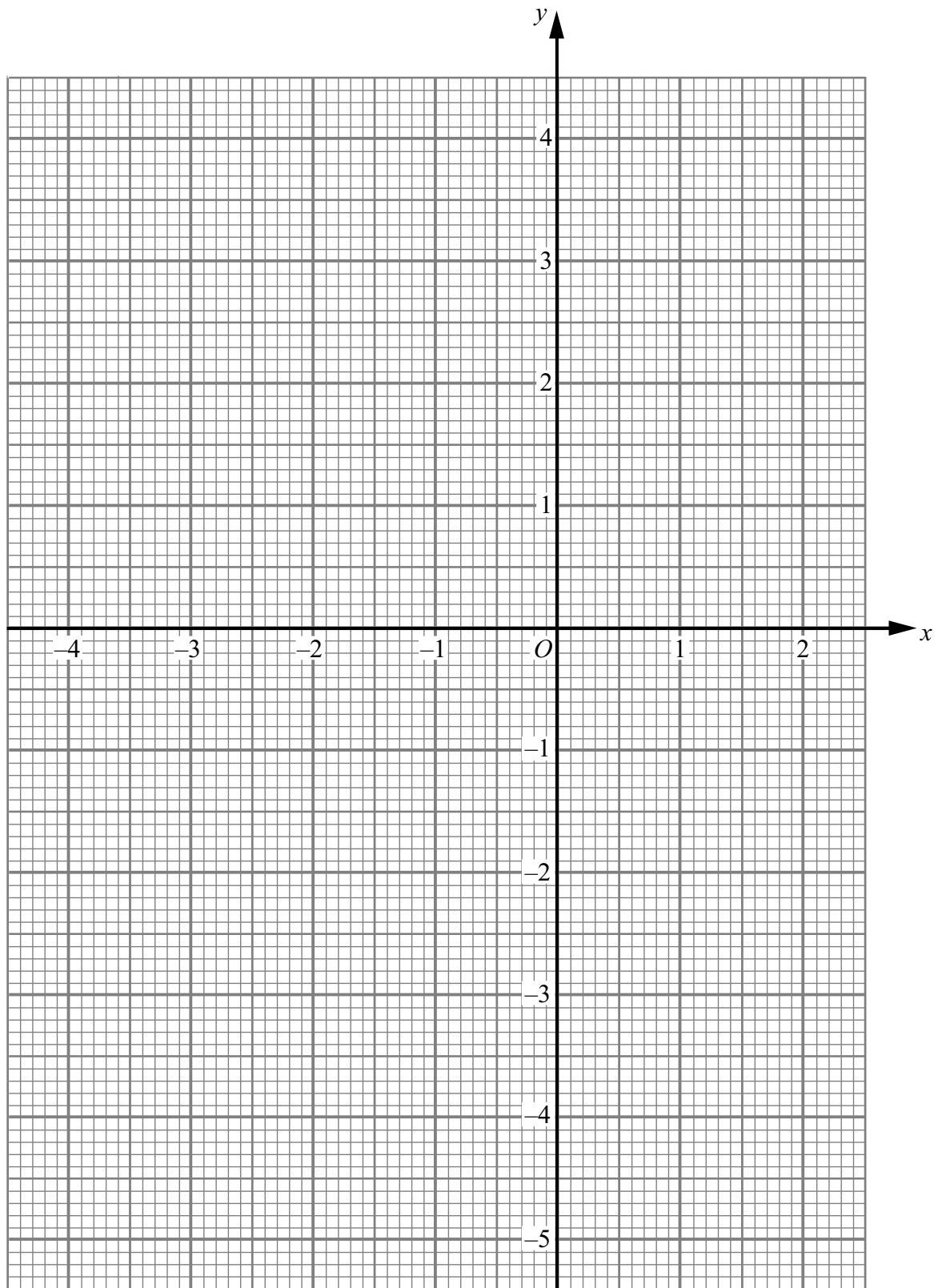
(2)

(c) Use the graph to find estimates of the solutions of the equation

$$x^2 + 2x - 4 = 0$$

.....
(2)





(Total for Question 11 is 6 marks)



12

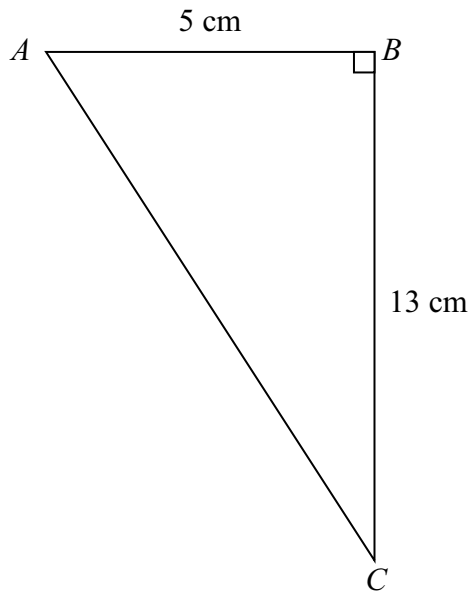


Diagram **NOT**
accurately drawn

ABC is a right-angled triangle.

$AB = 5$ cm.

$BC = 13$ cm.

Work out the length of AC .

Give your answer correct to 3 significant figures.

..... cm

(Total for Question 12 is 3 marks)



13

$$c^2 = \frac{2 \times 7 \times 10^6 + 9 \times 10^7}{7 \times 10^6 \times 9 \times 10^7}$$

Work out the value of c .

Give your answer in standard form correct to 2 significant figures.

.....
(Total for Question 13 is 3 marks)

- 14 When a number is increased by 15% the answer is 253
What is the number?

.....
(Total for Question 14 is 3 marks)



15 The diagram shows a quadrilateral $ABCD$.

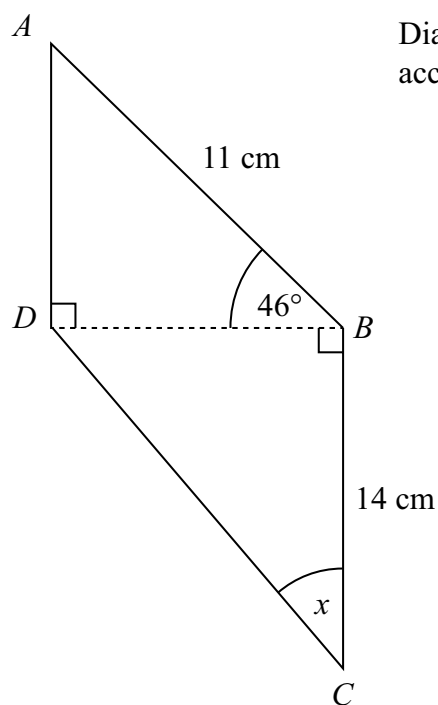


Diagram **NOT** accurately drawn

Angle $ADB = \text{Angle } DBC = 90^\circ$.

$AB = 11 \text{ cm}$.

$BC = 14 \text{ cm}$.

Angle $ABD = 46^\circ$.

Work out the size of the angle marked x .

(Total for Question 15 is 6 marks)



16 Solve the simultaneous equations.
You must show all your working.

$$3x + 8y = 6$$

$$5x - 2y = 33$$

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

(Total for Question 16 is 4 marks)



17 $m = kp^2$

Given that $m = 16$ when $p = 5$

(a) work out the value of k .

.....
(2)

(b) Work out the value of p when $m = 36$

.....
(2)

(Total for Question 17 is 4 marks)

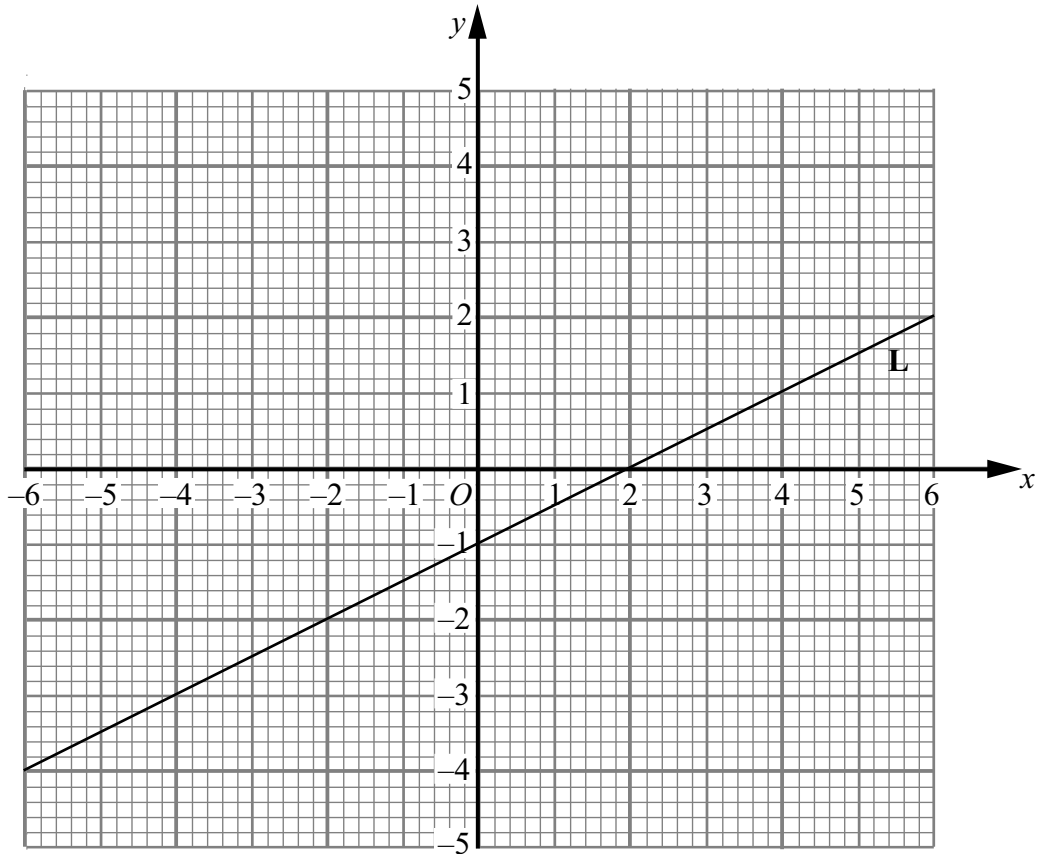
18 Solve $3x^2 - 5x - 1 = 0$

Give your solutions correct to 3 significant figures.

.....
(Total for Question 18 is 3 marks)



19



The straight line **L** has equation $y = \frac{1}{2}x - 1$

(a) Write down an equation of a line parallel to **L**.

.....
(1)

(b) Find an equation of the line that goes through the point (4, 1) and is perpendicular to **L**.

.....
(3)

(Total for Question 19 is 4 marks)



20 Make a the subject of the formula $2(a - m) = 7 - a$

$a = \dots\dots\dots$

(Total for Question 20 is 3 marks)



21 The diagram shows a solid shape.

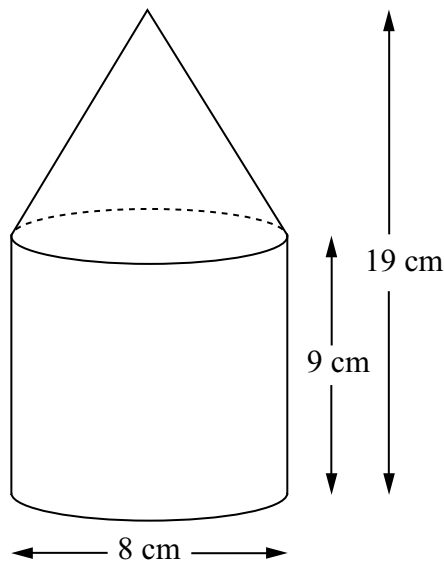


Diagram **NOT** accurately drawn

The shape is a cone on top of a cylinder.

The shape has a total height of 19 cm.

The base of the cone has a diameter of 8 cm.

The cylinder has a diameter of 8 cm and height 9 cm.

Work out the volume of the shape.

Give your answer correct to 3 significant figures.

..... cm³

(Total for Question 21 is 4 marks)



22 The diagram shows a sector of a circle of radius 6.8 cm.

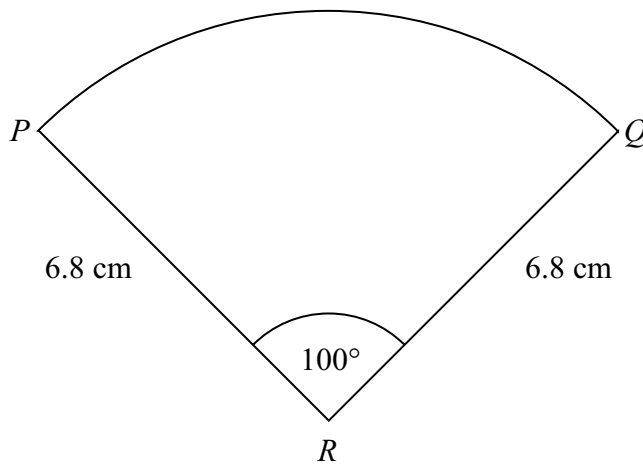


Diagram **NOT**
accurately drawn

PQ is an arc of the sector.

Angle $PRQ = 100^\circ$.

Work out the perimeter of the sector.

Give your answer correct to 3 significant figures.

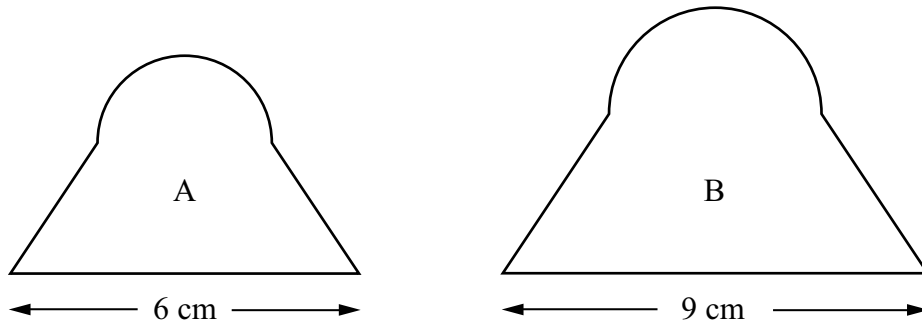
..... cm

(Total for Question 22 is 3 marks)



23 The diagram shows two similar solid shapes, A and B.

Diagram **NOT**
accurately drawn



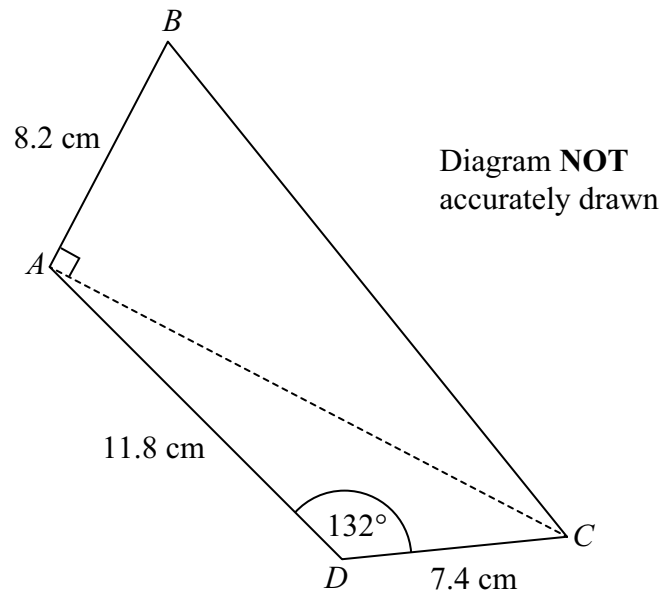
The total surface area of A is 103 cm^2 .

Work out the total surface area of B.

..... cm^2

(Total for Question 23 is 3 marks)



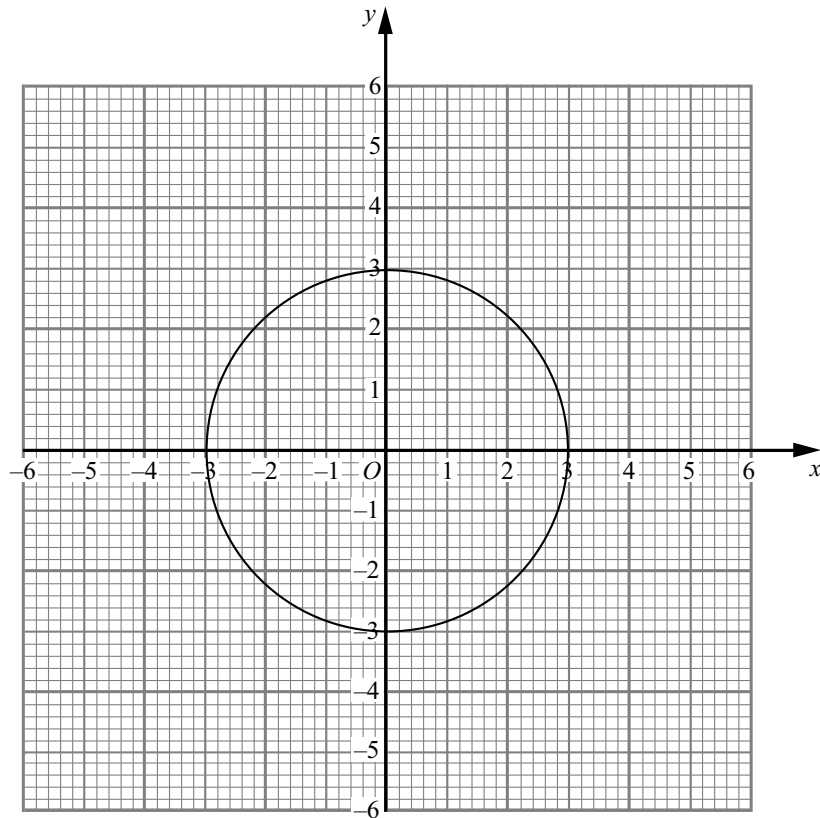


Work out the area of the quadrilateral $ABCD$.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 24 is 6 marks)





(a) Write down the equation of the circle.

.....
(1)

(b) Solve the equations $x^2 + y^2 = 25$
 $y - 2x = 5$

.....
(5)

(Total for Question 25 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS



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