

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

For Examiner's Use

General Certificate of Secondary Education
June 2007



MATHEMATICS (MODULAR) (SPECIFICATION B)
Module 5 Intermediate Tier
Paper 1 Non-Calculator

33005/I1

Monday 4 June 2007 1.30 pm to 2.45 pm

<p>For this paper you must have:</p> <ul style="list-style-type: none"> mathematical instruments. <p>You must not use a calculator.</p>	
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For Examiner's Use	
Pages	Mark
3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
TOTAL	
Examiner's Initials	

Time allowed: 1 hour 15 minutes

Instructions

- Use blue or black ink or ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Do all rough work in this book.

Information

- The maximum mark for this paper is 70.
- The marks for questions are shown in brackets.
- You may ask for more answer paper, graph paper and tracing paper. This must be tagged securely to this answer book.

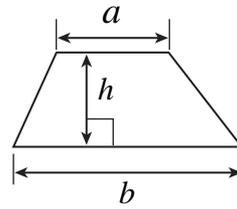
Advice

- In all calculations, show clearly how you work out your answer.

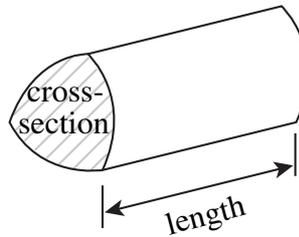
Formulae Sheet: Intermediate Tier

You may need to use the following formulae:

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



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



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

- 1 (a) Two sets of algebraic expressions are shown below.
Draw a line from each expression on the left to the equivalent expression on the right.
One line has been drawn for you.

$2x + x$	$3x$
$3x - x$	$3x + 1$
$3x \times x$	x^3
$3(x + 1)$	$3x^2$
$x \times x \times x$	$2x$
	3
	$3x + 3$

(4 marks)

- (b) Simplify $3p + 5q + p - 2q$

.....
.....

Answer (2 marks)

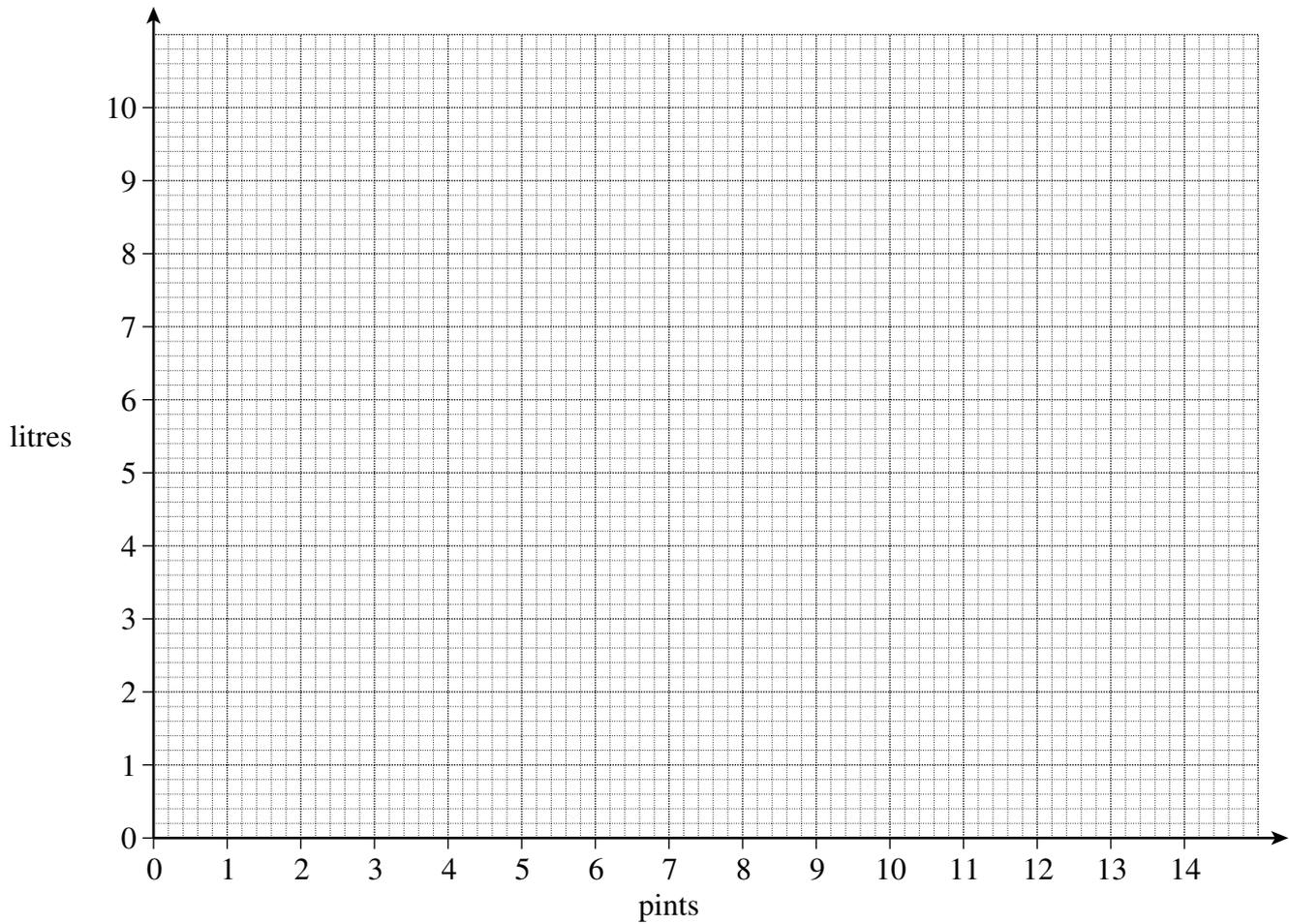
- (c) Simplify $6x \div 3$

.....

Answer (1 mark)

Turn over ►

- 2 (a) Use the fact that 7 pints = 4 litres to draw a conversion graph on the grid.



(2 marks)

Use your graph to convert

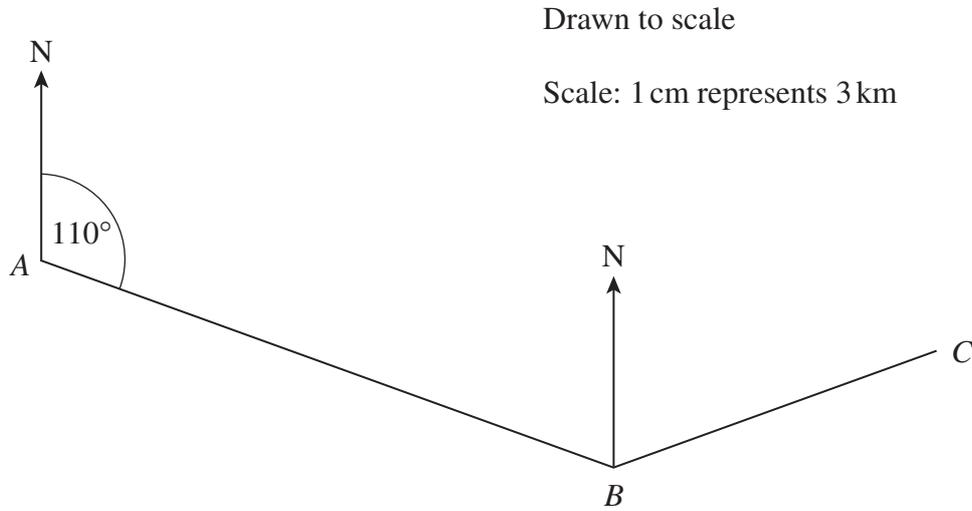
- (b) 10 pints to litres

Answer litres (2 marks)

- (c) 3 litres to pints.

Answer pints (2 marks)

- 3 The diagram shows three points A , B and C .
The three-figure bearing of B from A is 110° .



- (a) Work out the three-figure bearing of A from B .

.....

Answer^o (2 marks)

- (b) 1 cm represents 3 km.

Work out the actual length of BC .
Give your answer in kilometres.

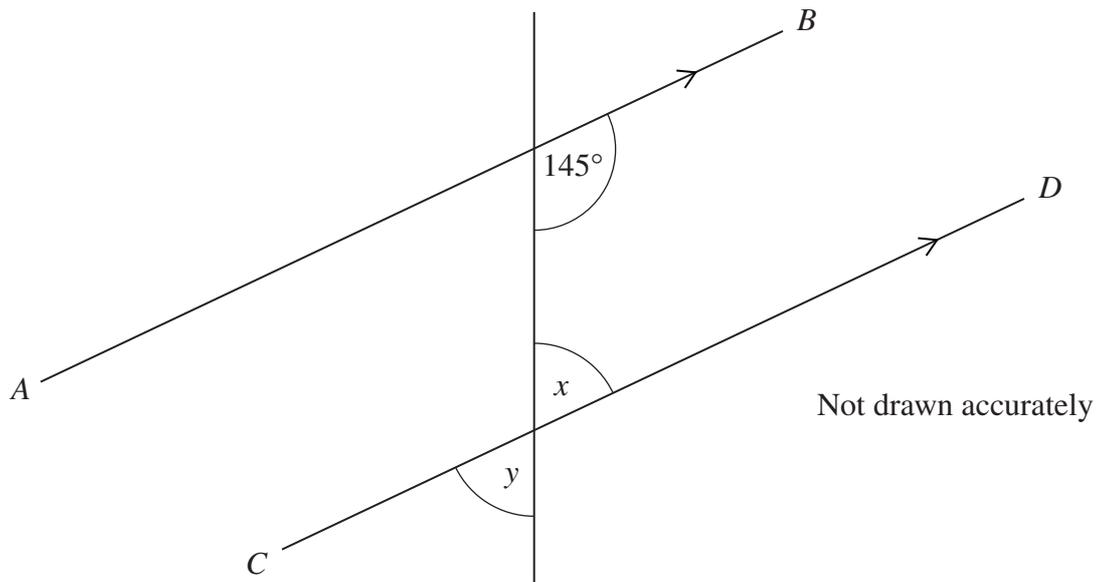
.....

Answer km (2 marks)

Turn over for the next question

Turn over ►

4 In the diagram AB is parallel to CD .



(a) Work out the value of x .

.....

Answer degrees (2 marks)

(b) (i) Write down the value of y .

Answer degrees (1 mark)

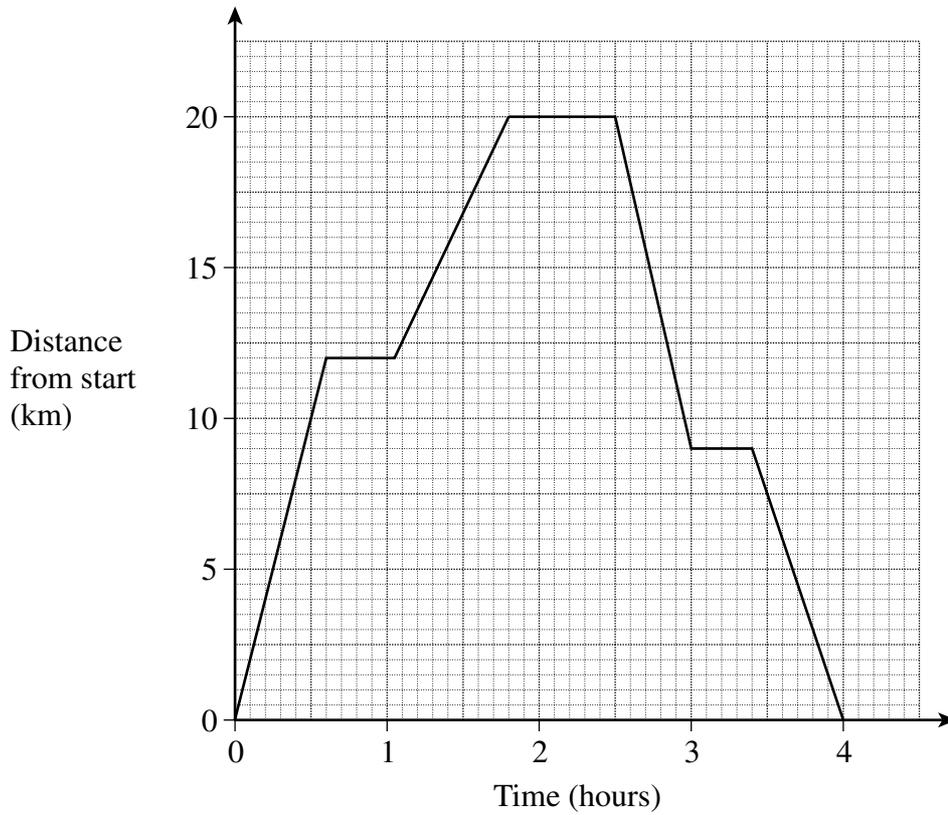
(ii) Give a reason for your answer.

.....

.....

(1 mark)

5 The graph shows Adil's bicycle journey.



(a) How many times does Adil stop on his journey?

Answer (1 mark)

(b) What is the total distance that Adil travels on his journey?

.....

Answer km (1 mark)

(c) Calculate Adil's average speed during the first 30 minutes of his journey. Give your answer in kilometres per hour.

.....
.....
.....

Answer km/h (2 marks)

- 6 (a) Solve the equation $6y - 1 = 20$

.....
.....

Answer $y =$ (2 marks)

- (b) Jon thinks of a number.
He adds 6 to the number and then divides by 4.
The answer is 5.

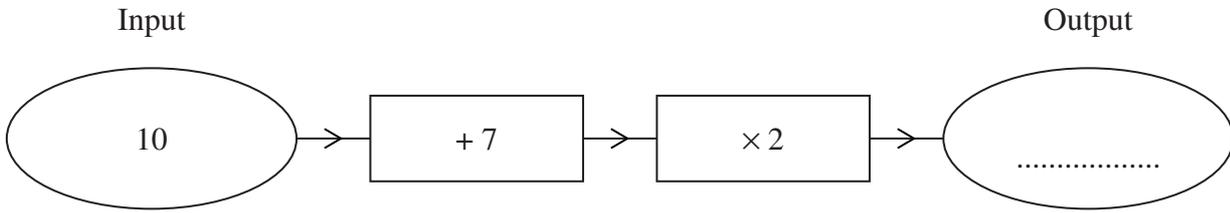
What was the number?

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.....
.....

Answer (2 marks)

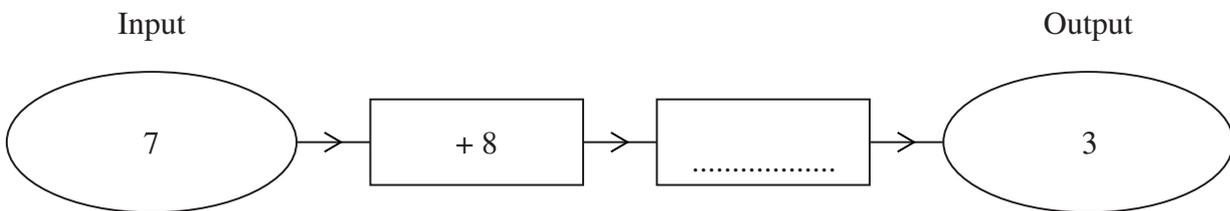
7 Complete the flow diagrams to make them work.

(a)



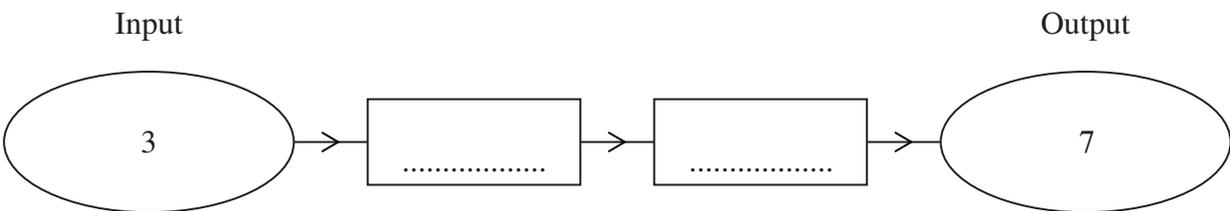
(1 mark)

(b)



(1 mark)

(c)



(1 mark)

Turn over for the next question

Turn over ►

8 Factorise fully

(a) $4x + 8$

.....

Answer (1 mark)

(b) $4x^2 + 8x$

.....

Answer (2 marks)

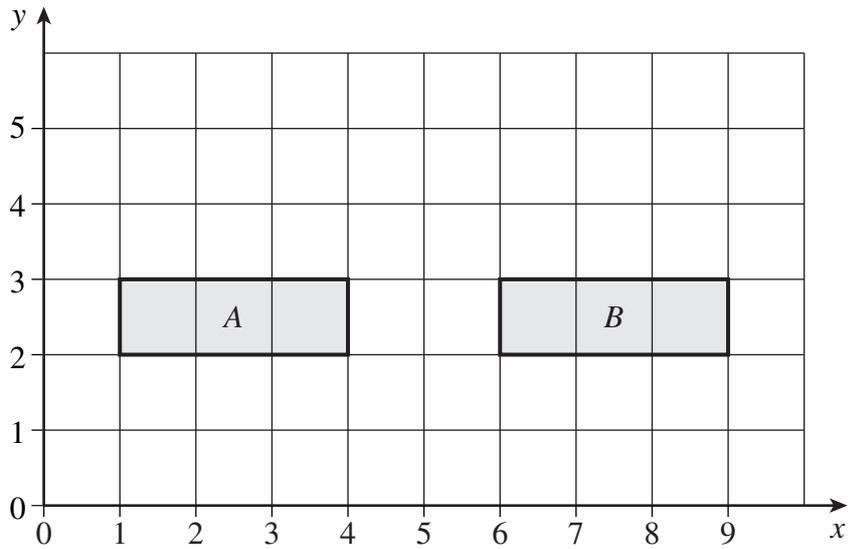
9 Work out the integer values of n which satisfy the inequality $15 \leq 5n < 30$

.....

.....

Answer (3 marks)

10 The diagram shows two rectangles *A* and *B*.



Complete the sentences.

(a) Rectangle *B* is a reflection of rectangle *A* in the line

(1 mark)

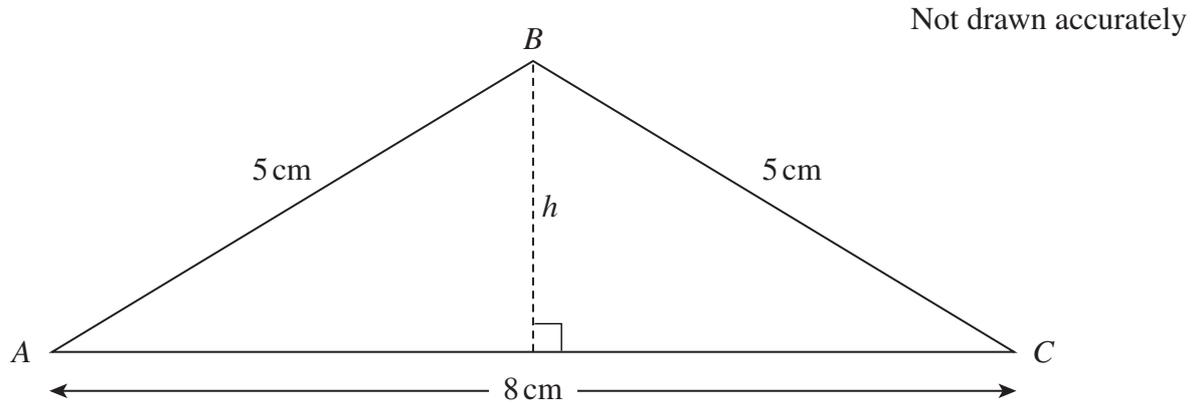
(b) Rectangle *B* is a translation of rectangle *A* by the vector $\begin{pmatrix} \dots\dots\dots \\ \dots\dots\dots \end{pmatrix}$

(1 mark)

(c) Rectangle *B* is a rotation of rectangle *A* through
..... degrees about the point (..... ,) .

(2 marks)

11 The diagram shows an isosceles triangle ABC .



(a) Calculate the height of the triangle (marked h on the diagram).

.....

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.....

.....

Answer cm (3 marks)

(b) Calculate the area of the triangle ABC .
State the units of your answer.

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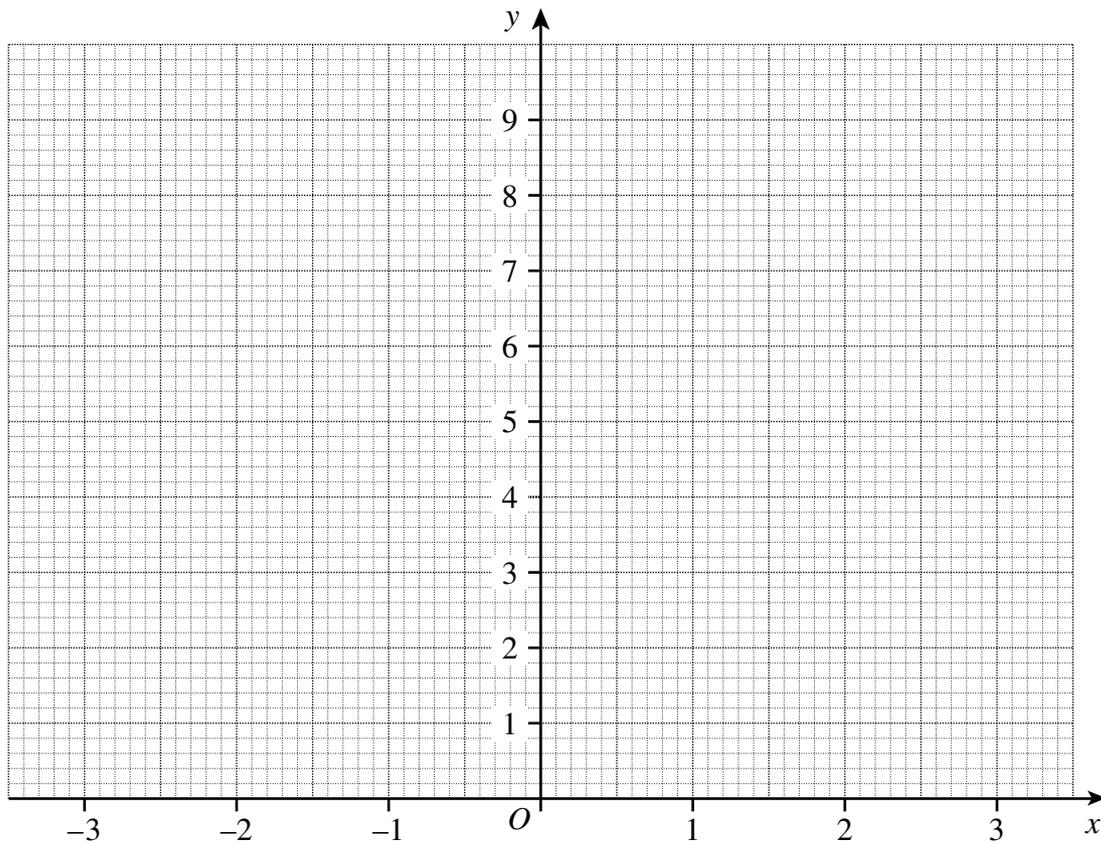
Answer (3 marks)

12 (a) Explain why the value of x^2 is **never** negative.

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(1 mark)

(b) On the grid, draw the graph of $y = x^2$ for values of x from -3 to $+3$.

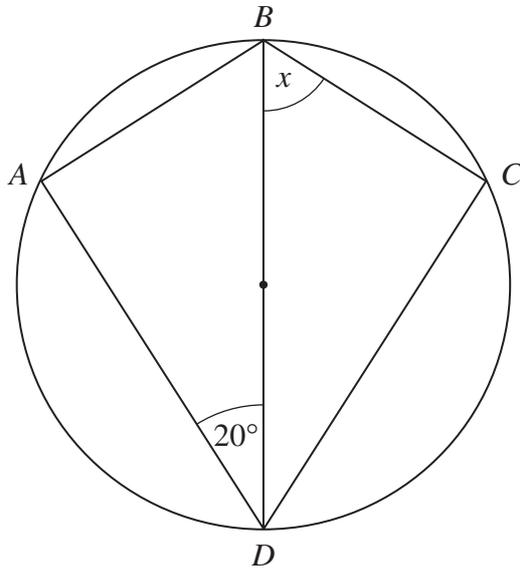


(2 marks)

(c) Use your graph to find the positive solution to the equation $x^2 = 3$

Answer $x =$ (1 mark)

- 13 (a) The diagram shows four points A , B , C and D on the circumference of a circle.
 BD is a diameter.
 $ABCD$ is a kite.



Not drawn accurately

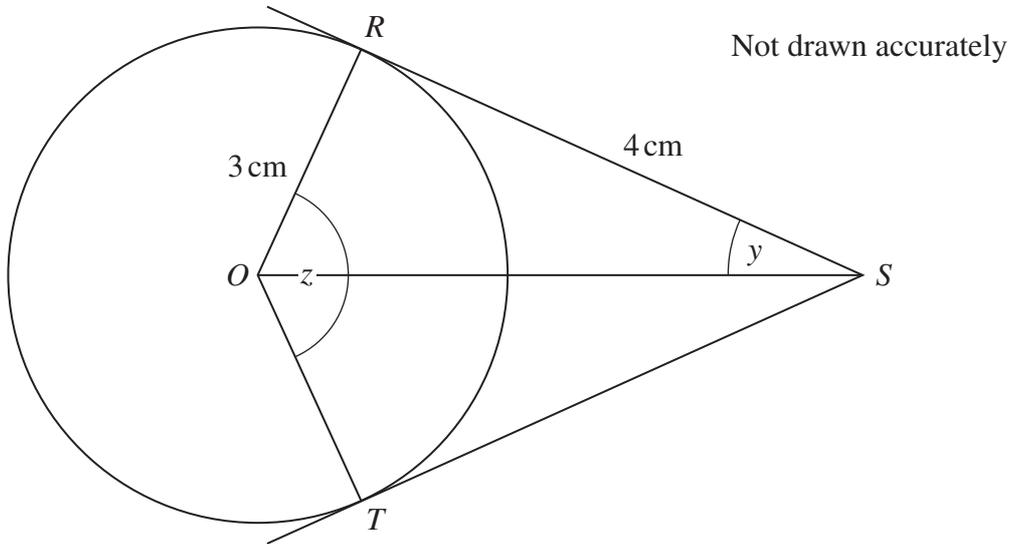
Work out the value of x .

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.....

Answer degrees (2 marks)

- (b) The diagram shows a circle with centre O .
 RS and TS are tangents to the circle.
 $OR = 3$ cm and $RS = 4$ cm.



- (i) Write down the length of TS .

Answer cm (1 mark)

- (ii) Give a reason for your answer.

.....

 (1 mark)

- (iii) Use the facts below to write down the value of y .

$$\sin 48.6^\circ = \frac{3}{4} \quad \cos 41.4^\circ = \frac{3}{4} \quad \tan 36.9^\circ = \frac{3}{4}$$

Answer $y =$ degrees (1 mark)

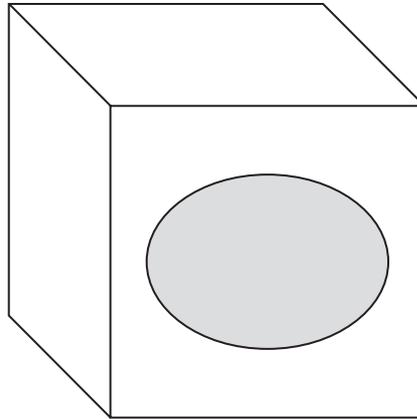
- (iv) Use your answer to part (iii) to work out the value of z .

.....

Answer degrees (3 marks)

14 The diagram shows a cube.
The volume of the cube is 1000 cm^3 .

(a) A label covers half the area of the front of the cube.



Calculate the area of the label.
Show your working.

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Answer cm^2 (3 marks)

(b) The cube contains 200 cm^3 of water.

How much more water is needed for the cube to be three-quarters full?
Give your answer in litres.

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.....

.....

Answer litres (3 marks)

15 In the expressions in the table x , y and z represent lengths.

	Expression	Length	Area	Volume	None
A	xy		✓		
B	$xy(x + y)$				
C	$xy + z$				
D	y^2				

- (a) Complete the table to show whether each expression could represent length, area, volume or none of these.

(3 marks)

- (b) Explain your answer for expression C.

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(1 mark)

END OF QUESTIONS

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