

**Question 1**

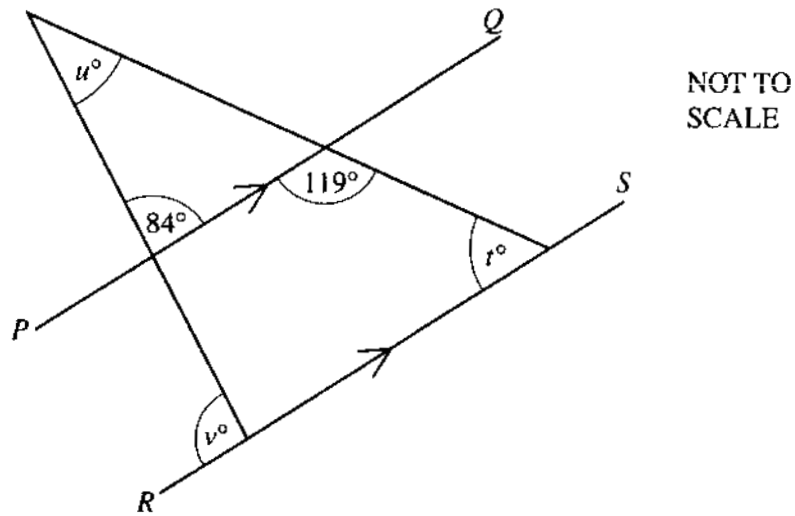
(a) Write down the value of  $\tan 63.5^\circ$ , correct to three decimal places.

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

(b) Write down the angle whose cosine is 0.25, correct to the nearest tenth of a degree.

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

**Question 2**



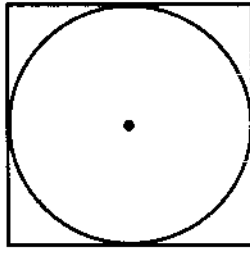
In the diagram the lines  $PQ$  and  $RS$  are parallel.  
Calculate the values of  $t$ ,  $u$  and  $v$ .

Answer  $t =$  .....

$u =$  .....

$v =$  ..... [3]

Question 3



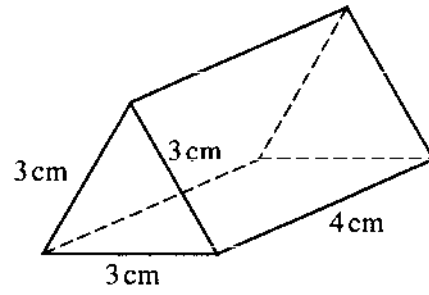
The area of the square is  $144 \text{ cm}^2$ .  
Calculate the area of the circle.  
[For  $\pi$ , use either your calculator value or 3.142.]

*Answer* .....  $\text{cm}^2$  [3]



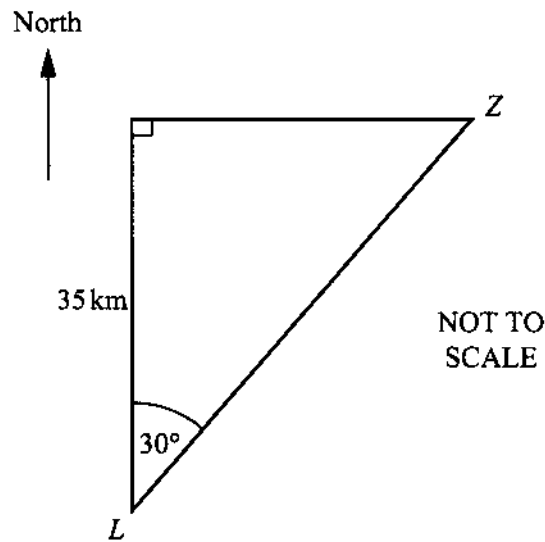
Question 4

NOT TO  
SCALE



The diagram shows a triangular prism of length 4 cm.  
The cross-section is an equilateral triangle of side 3 cm.  
Draw an accurate net of the prism.

Question 5



The centre of Zurich ( $Z$ ) is 35 kilometres north of the centre of Lucerne ( $L$ ).  
The bearing of  $Z$  from  $L$  is  $030^\circ$ .

(a) Calculate the distance that  $Z$  is east of  $L$ .

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

(b) Calculate the bearing of  $L$  from  $Z$ .

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

Question 6

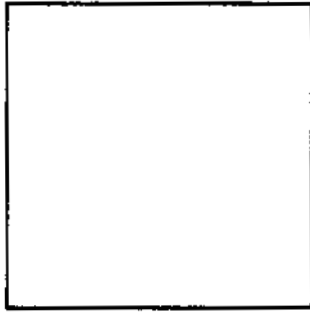


Diagram 1

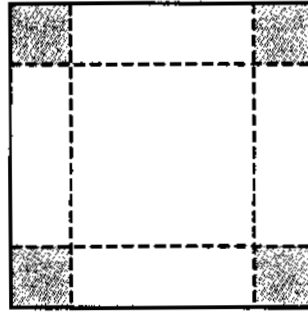


Diagram 2

A square card (Diagram 1) has sides of length 11 cm.

- (a) Write down the area of the card.

Answer (a) .....cm<sup>2</sup> [1]

- (b) Four equal squares, each with sides of length 2 cm, are cut from the corners of the square card, as shown in Diagram 2.

Work out the area of card remaining.

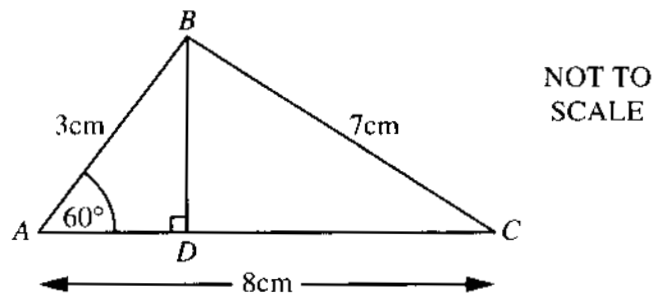
Answer (b) .....cm<sup>2</sup> [1]

- (c) The card is now folded along the broken lines to make a box without a lid.

Work out the volume of the box.

Answer (c) .....cm<sup>3</sup> [2]

Question 7



In triangle  $ABC$ ,  $AB = 3\text{ cm}$ ,  $BC = 7\text{ cm}$ ,  $AC = 8\text{ cm}$  and angle  $A = 60^\circ$ .  
 $BD$  is perpendicular to  $AC$ .  
Calculate

(a) the length of  $AD$ ,

Answer (a)  $AD = \dots\dots\dots\text{cm}$  [2]

(b) the length of  $DC$ ,

Answer (b)  $DC = \dots\dots\dots\text{cm}$  [1]

(c) the size of angle  $C$ .

Answer (c) angle  $C = \dots\dots\dots$  [2]

**Question 8**

(a) A square has sides of length 9 cm.

(i) Write down its area.

Answer (a)(i) .....cm<sup>2</sup> [1]

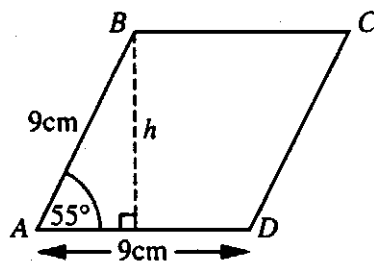
(ii) Write down its perimeter.

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

(iii) Use Pythagoras' Theorem to calculate the length of a diagonal of the square.  
Give your answer correct to two decimal places.

Answer (a)(iii) .....cm [3]

(b)



NOT TO  
SCALE

The diagram shows a rhombus with sides of length 9 cm. Angle  $BAD = 55^\circ$ .  
Calculate

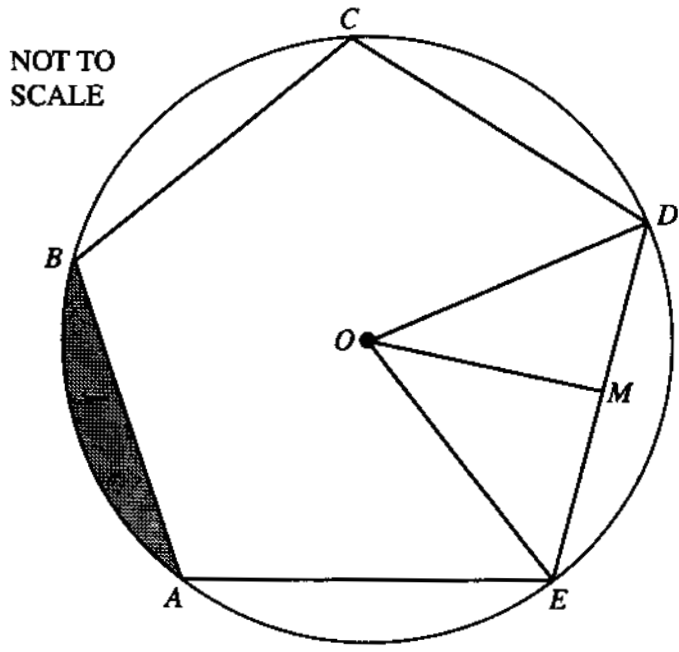
(i)  $h$ , the height of the rhombus,

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

(ii) the area of the rhombus.

Answer (b)(ii) .....cm<sup>2</sup> [1]

Question 9



The vertices of a regular pentagon  $ABCDE$  lie on the circumference of a circle, centre  $O$ .  $M$  is the mid-point of  $DE$ .

(a) Explain why angle  $MOE = 36^\circ$ .

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

(b) Find (i) angle  $OED$ ,

Answer (b)(i) angle  $OED =$  ..... [1]

(ii) angle  $DEA$ .

Answer (b)(ii) angle  $DEA =$  ..... [1]

(c) The length of  $OE$  is 9.7 cm.  
 Calculate the length of (i)  $ME$ ,

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

(ii) a side of the pentagon.

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



**Question 9**

**(d)** Calculate the area of **(i)** triangle *ODE*,

*Answer(d)(i)* ..... cm<sup>2</sup> [3]

**(ii)** the pentagon.

*Answer(d)(ii)* ..... cm<sup>2</sup> [1]

**(e)** Calculate the area of the circle. (For  $\pi$ , use either your calculator value or 3.142.)

*Answer (e)* ..... cm<sup>2</sup> [2]

**(f)** Calculate the shaded area, giving your answer to the nearest square centimetre.

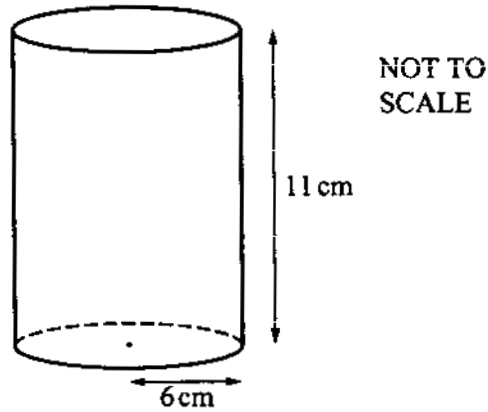
*Answer (f)* ..... cm<sup>2</sup> [2]

Question 10

- (a) Calculate the circumference of a circle, radius 6 cm.  
[For  $\pi$ , use either your calculator value or 3.142.]

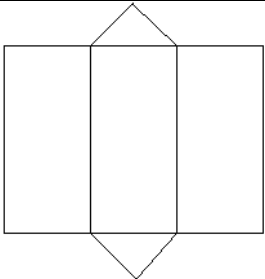
Answer (a) ..... cm [2]

- (b)



The diagram shows a cylinder of radius 6 cm and height 11 cm.  
Use your answer to part (a) to calculate the **curved** surface area of the cylinder.

Answer (b) .....  $\text{cm}^2$  [2]

QUESTION	ANSWER	MARK	
1 (a)	2.006	1	Correct answer only
(b)	75.5	1	Correct answer only
2	t = 61 u = 35 v = 96	1, 1, 1	Correct answers only
3	113	3	Accept 113.0973355 or 113.112 or 113.04 (B1) for radius = 6 seen or implied (M1) for formula $\pi \times$ ('his' radius) <sup>2</sup> (SC2) for 452 – candidate has calculated $\pi \times 12^2$
4		3	(B1) three rectangles and two triangles (B1) three accurate rectangles with sides $3 \pm 0.1$ by $4 \pm 0.1$ cm (B1) two accurate equilateral triangles with sides $3 \pm 0.1$ cm
5 (a)	20.2	2	(M1) for $35 \times \tan 30$ or equivalent longer method
(b)	$210^\circ$	2	(B1) for $180 + 30$
6 (a)	121	1	
(b)	105	1	
(c)	98	2	(M1) for $(11 - 4) \times (11 - 4) \times 2$
7 (a)	1.5	2	(M1) for $3 \times \cos 60$ seen or equivalent longer method
(b)	6.5	1	$\sqrt{\quad}$ award (B1) for $8 - (a)$
(c)	$21.8^\circ$	2	$\sqrt{\quad}$ award (M1) for $\cos^{-1}((b) \div 7)$ or $\cos C = (b) \div 7$ or equivalent longer method
8 (a) (i)	81	1	} If no marks earned, award (SC1) for correct area and perimeter of 'his' rectangle
(a)(ii)	36	1	
(a)(iii)	12.73	3	(SC2) for correct answer but not given to 2 decimal places (M1) for $\sqrt{9^2 + 9^2}$ or equivalent
(b)(i)	7.37(...)	2	(M1) for $\frac{h}{9} = \sin 55^\circ$ or $h^2 + (9 \cos 55^\circ)^2 = 9^2$ or equivalent
(b)(ii)	66.3 to 66.4	1	$\sqrt{\quad}$ award (B1) for $9 \times (b)(i)$
9 (a)	$360 \div 10 = 36$	1	Accept $360 \div 5 = 72$ followed by $72 \div 2 = 36$ or equivalent
(b)(i)	54	1	Correct answer only
(b)(ii)	108	1	$\sqrt{\quad}$ award (B1) for $2 \times (b)(i)$
(c)(i)	5.70	2	Accept 5.701516947 rounded to $\geq 3$ s.f. $\sqrt{\quad}$ award (M1) for $0.7 \times \cos (b)(i)$ or equivalent method

QUESTION	ANSWER	MARK	
(c)(ii)	11.4	1	Accept 11.40303389 rounded to $\geq 3$ s.f.
(d)(i)	44.7	3	$\checkmark$ award (M1) for $OM = \sqrt{9.7^2 - ((c)(i))^2}$ or $OM = 9.7$ or $OM = 7.84(\dots)$ seen or implied $\checkmark$ award (M1) for $0.5 \times (c)(ii) \times$ 'his' OM $\checkmark$ award (SC1) for correct follow through answer
(d)(ii)	224	1	Accept 223.5 $\checkmark$ award (B1) for $5 \times (d)(i)$
(e)	296	2	Accept 295.(...) (M1) for $\pi \times 9.7^2$
(f)	14	2	Correct answer only $\checkmark$ award (B1) for $((e) - (d)(ii)) \div 5$ seen or implied, e.g. 14.4
10 (a)	37.7	2	Accept 37.69911184 or 37.68 or 37.704 rounded to $\geq 3$ s.f. (M1) for $2 \times \pi \times 6$ or $\pi \times 12$
(b)	415	2	Accept 414.7 or a follow through correct answer rounded to $\geq 3$ s.f. $\checkmark$ award (M1) for (a) x 11

### TYPES OF MARK

Most of the marks (those without prefixes and 'B' marks) are given for accurate results, drawings or statements.

'M' marks are awarded for any correct method applied to the appropriate numbers.

'B' marks are given for a correct statement or step.

'A' marks are for accurate results or statements but are awarded only if the relevant 'M' marks have been earned.

'SC' marks are awarded in special cases.

The symbol ' $\checkmark$ ' indicates that a previous error is to be 'followed through' i.e. the mark can be gained if the candidate has made no further error in obtaining the relevant result.