



**Free-Standing Mathematics Qualification**

***Working in 2 and 3 Dimensions***  
**6982/2**

Foundation Level

**Mark Scheme**

*2008 examination – June series*

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

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## Key to mark scheme and abbreviations used in marking

M	mark is for method		
m or dM	mark is dependent on one or more M marks and is for method		
A	mark is dependent on M or m marks and is for accuracy		
B	mark is independent of M or m marks and is for method and accuracy		
E	mark is for explanation		
✓ or ft or F	follow through from previous incorrect result	MC	mis-copy
CAO	correct answer only	MR	mis-read
CSO	correct solution only	RA	required accuracy
AWFW	anything which falls within	FW	further work
AWRT	anything which rounds to	ISW	ignore subsequent work
ACF	any correct form	FIW	from incorrect work
AG	answer given	BOD	given benefit of doubt
SC	special case	WR	work replaced by candidate
OE	or equivalent	FB	formulae book
A2,1	2 or 1 (or 0) accuracy marks	NOS	not on scheme
-x EE	deduct $x$ marks for each error	G	graph
NMS	no method shown	c	candidate
PI	possibly implied	sf	significant figure(s)
SCA	substantially correct approach	dp	decimal place(s)

### No Method Shown

Where the question specifically requires a particular method to be used, we must usually see evidence of use of this method for any marks to be awarded. However, there are situations in some units where part marks would be appropriate, particularly when similar techniques are involved. Your Principal Examiner will alert you to these and details will be provided on the mark scheme.

Where the answer can be reasonably obtained without showing working and it is very unlikely that the correct answer can be obtained by using an incorrect method, we must award **full marks**. However, the obvious penalty to candidates showing no working is that incorrect answers, however close, earn **no marks**.

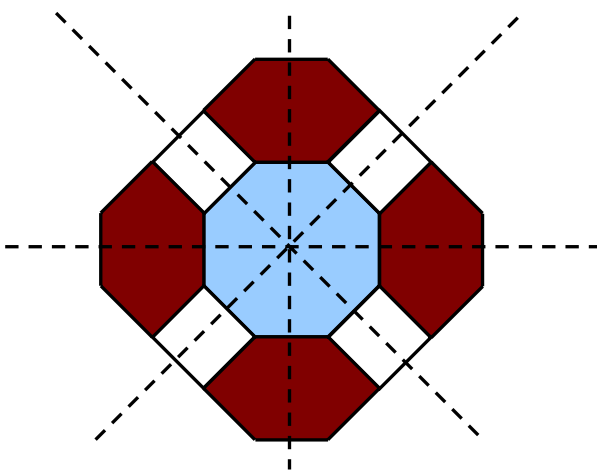
Where a question asks the candidate to state or write down a result, no method need be shown for full marks.

Where the permitted calculator has functions which reasonably allow the solution of the question directly, the correct answer without working earns **full marks**, unless it is given to less than the degree of accuracy accepted in the mark scheme, when it gains **no marks**.

**Otherwise we require evidence of a correct method for any marks to be awarded.**

**Free-Standing Mathematics Qualification**  
**Foundation Level: Working in 2 and 3 dimensions (6982/2)**  
**Answers and Marking Scheme June 2008**

**Question 1**

<b>(a)</b>	4	<b>B1</b>	
<b>(b)</b>	 <p>1 correct line of symmetry All lines of symmetry</p>	<b>B1</b> <b>B1</b>	Do not allow second B1 if there are extra incorrect lines
<b>(c)</b>	Regular octagon	<b>B1</b>	Accept octagon
	<b>TOTAL</b>	<b>4</b>	

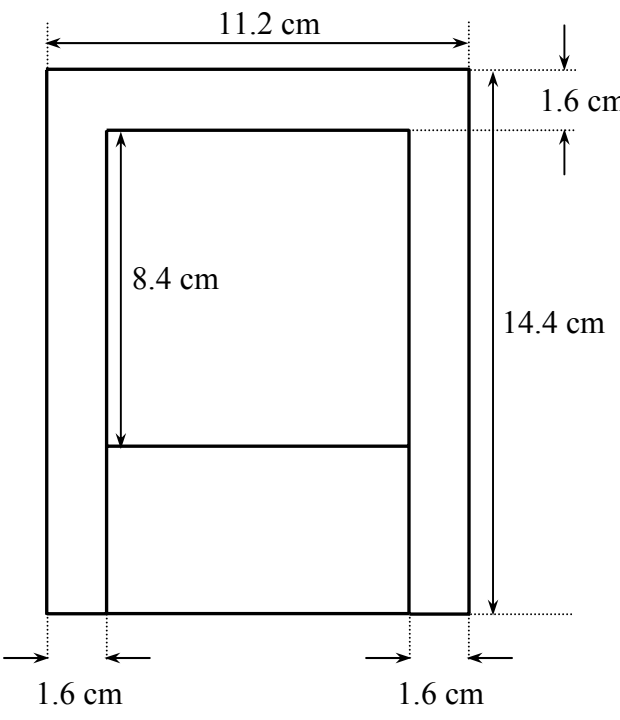
**Question 2**

<b>(a)</b>	Length = 270 (cm) Width = 240 (cm)	<b>B1</b> <b>B1</b>	
<b>(b)(i)</b>	Number of tiles along length = $270/30 = 9$	<b>B1</b>	
<b>(ii)</b>	Number of tiles along width = $240/30 = 8$	<b>B1</b>	
<b>(iii)</b>	Total number of tiles = $9 \times 8$ = 72	<b>M1</b> <b>A1</b> ✓	
	<b>TOTAL</b>	<b>6</b>	

**Question 3**

	<p>Radius = 22.5 cm          Area = <math>\pi r^2 = \pi \times 22.5^2</math>  <math>= 1590.431281\dots \text{ (cm}^2\text{)}</math></p>	<p><b>B1</b>  <b>M1</b>  <b>A1</b></p>	<p>Allow use of diameter          Allow omission of units. Accept values that round to 1590 or 1591 (from other values of <math>\pi</math>)</p>
	<b>TOTAL</b>	<b>3</b>	

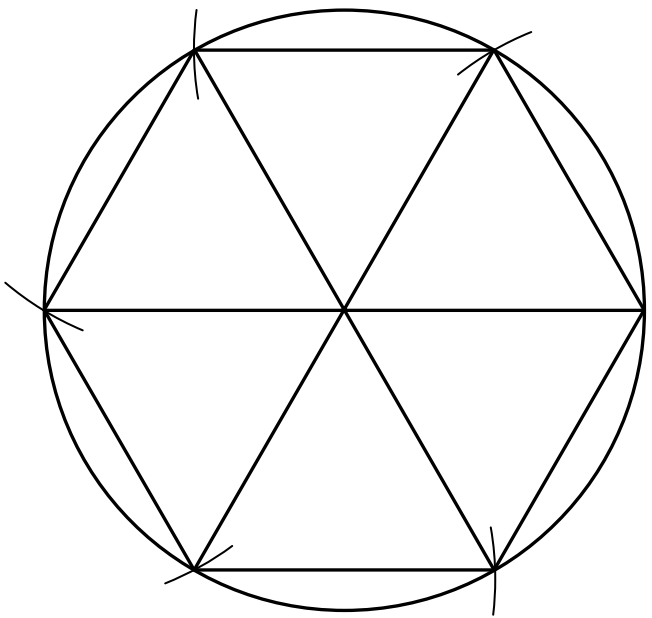
**Question 4**

	 <p>The diagram shows a rectangular base with a door cutout. The base has a total width of 11.2 cm and a total height of 14.4 cm. The door is 8.4 cm high and 11.2 cm wide. The door is positioned 1.6 cm from the top and 1.6 cm from the sides of the base. Dotted lines indicate the alignment and offsets.</p>	<p><b>B1</b>  <b>B1</b>  <b>B1</b>  <b>B1</b>  <b>B1</b></p>	<p>Accuracy to <math>\pm 0.2</math> cm          Top 11.2 cm          Sides 14.4 cm perpendicular to top          Door top and sides 1.6 cm from top and sides of base and parallel to them          Height of door 8.4 cm          Line across centre of base and no extra lines (e.g. from sides of base unit)</p> <p>SC1 for 2 dimensions calculated correctly but not drawn          SC1 for correctly drawn diagram using consistent but different scale (e.g. 1:10)</p>
	<b>TOTAL</b>	<b>5</b>	

**Question 5**

<b>(a)</b>	Equilateral	<b>B1</b>	
<b>(b) (i)</b>	Area = $\frac{1}{2} \times 4 \times 3.5$ = 7 (cm <sup>2</sup> ) (or 6.928..from other methods)	<b>M1</b> <b>A1</b>	Use of correct values in formula Allow omission of units
<b>(ii)</b>	Volume = 7 × 21 = 147 (cm <sup>3</sup> ) (or 145.49... ft from 6.928.. in part (b)(i))	<b>M1</b> <b>A1</b> ✓	Using their answer from (b)(i) Allow omission of units
	<b>TOTAL</b>	<b>5</b>	

**Question 6**

		<b>B1</b> <b>M1</b> <b>A1</b> ✓ <b>B1</b> ✓	Circle radius 4 cm Accuracy ± 0.1 cm  Arcs for hexagon.  Sides equal Accuracy ± 0.2 cm ft on their circle  All diagonals drawn  (B1,B1 for totally correct diagram without construction lines.)
	<b>TOTAL</b>	<b>4</b>	

**Question 7**

	$\begin{aligned} \text{Volume} &= \text{length} \times \text{width} \times \text{height} \\ &= 5 \times 3.5 \times 2.5 \\ &= 43.75 \\ &\text{m}^3 \end{aligned}$	<b>M1</b> <b>A1</b> <b>B1</b> <b>(units)</b>	Accept values rounded to 2 or 3 sf
	<b>TOTAL</b>	<b>3</b>	

**Question 8**

<b>(a)(i)</b>	$x = 120^\circ$	<b>B1</b>	Allow $118^\circ$ to $122^\circ$
<b>(ii)</b>	$120^\circ$	<b>B1</b> ✓	ft from (a)(i)
<b>(b)(i)</b>	30 (mm)	<b>B1</b>	Accuracy $\pm 1$ mm Do not allow 3 cm
<b>(ii)</b>	$\begin{aligned} \text{Actual length} &= 30 \times 50 \\ &= 1500 \text{ (mm)} \\ &= 1.5 \text{ (m)} \end{aligned}$	<b>M1</b> <b>A1</b> ✓ <b>B1</b> ✓	Allow if done correctly in cm. Conversion to metres  Alternatively : length on plan = $0.03\text{(m)}$ (B1✓ conversion) Actual length = $0.03 \times 50$ M1 $= 1.5 \text{ (m)}$ A1 ✓
	<b>TOTAL</b>	<b>6</b>	

**Question 9**

	$\begin{aligned} \text{Area of wall} &= 5 \times 2.5 = 12.5 \text{ (m}^2\text{)} \\ \text{Area of absorption panel} &= 1.8 \times 1.2 = 2.16 \text{ (m}^2\text{)} \\ \text{Area of remaining wall} &= 12.5 - 2.16 \\ &= 10.34 \text{ m}^2 \end{aligned}$	<b>B1</b> <b>B1</b> <b>M1</b> <b>A1</b> ✓	Allow 10 and 10.3 Must give units.
	<b>TOTAL</b>	<b>4</b>	
	<b>TOTAL MARK FOR PAPER</b>	<b>40</b>	