

# Similarity

## Mark Scheme 2

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Topic	Shape, Space and Measures
Sub Topic	Similarity
Booklet	Mark Scheme 2

**Time Allowed:** 56 minutes

**Score:** /47

**Percentage:** /100

**Grade Boundaries:**

A*	A	B	C	D	E	U
>85%	75%	70%	60%	55%	50%	<50%

Question	Working	Answer	Mark	Notes
1.□ (a)	$\frac{27.5}{11}$ or $\frac{11}{27.5}$		2	M1
		2.5		A1 oe
(b)	$5 \times "2.5"$ or $5 \times \frac{27.5}{11}$ or $\frac{RQ}{5} = \frac{27.5}{11}$ oe or $\frac{5}{11} = \frac{RQ}{27.5}$ oe		2	M1 Correct expression for $RQ$ or correct equation to give $RQ$ . ft their answer to (a)
		12.5		A1
(c)	$42.5 \div "2.5"$ or $42.5 \times \frac{11}{27.5}$ or $42.5 \times \frac{5}{"12.5"}$ or $\frac{CD}{42.5} = \frac{11}{27.5}$ or $\frac{CD}{42.5} = \frac{5}{"12.5"}$ oe		2	M1 Correct expression for $CD$ or correct equation to give $CD$ . ft their $RQ$ , if used. ft their answer to (a)
		17		A1
(d)	$54 \times ("2.5")^2$ oe or $\frac{\text{Area}}{54} = \left(\frac{27.5}{11}\right)^2$ oe		2	M1 Correct expression for area or correct equation to give area. ft ratio from (a), if used.
		337.5		A1
				<b>Total 8 marks</b>

Question	Working	Answer	Mark	Notes
2.	$\frac{20}{16}$ (=1.25) or $\frac{20}{16} \times 14$ oe (=17.5) or $\frac{AC}{20} = \frac{14}{16}$ oe			M1 or for a correct scale factor eg. $\frac{20}{16}$ or $\frac{16}{20}$ or 1.25 or 0.8 or $\frac{14}{16}$ oe or $\frac{16}{14}$ oe
	eg. $14 \times \frac{20}{16} - 14$			M1 for complete method
		3.5	3	A1
				<b>Total 3 marks</b>

Question	Working	Answer	Mark	Notes
3. (a)	$7.8 \times 10^8 \times 1000$ or $7.8 \times 10^{11}$ or $8 \div 1000$ or 0.008			M1 for correct conversion from m to km or from km to m
	$7.8 \times 10^8 \times 1000 \div 8$ or $7.8 \times 10^8 \div 0.008$			M1 (indep) award for digits 975 (eg. an answer of $9.75 \times 10^7$ gets M0 M1 A0)
		$9.75 \times 10^{10}$	3	A1 cao
(b)	$1.95 \times 10^{10}$ km			B1 cao
	$\frac{1.95 \times 10^{10}}{9.75 \times 10^{10}}$ (=0.2(km)) or $\frac{1.95 \times 10^{13}}{9.75 \times 10^{10}}$ (=200(m)) or $\frac{1.95 \times 10^{10}}{7.8 \times 10^8} \times 8$ (=200(m)) or $\frac{1.95 \times 10^{13}}{7.8 \times 10^{11}} \times 8$ (=200(m)) <b>NB: 1.95 may be the candidate's upper bound</b>			M1 ft from (a) also award for $\frac{1.9 \times 10^{10}}{9.75 \times 10^{10}}$ or $\frac{1.9 \times 10^{13}}{9.75 \times 10^{10}}$ or $\frac{1.9 \times 10^{10}}{7.8 \times 10^8} \times 8$ or $\frac{1.9 \times 10^{13}}{7.8 \times 10^{11}} \times 8$
		200	3	A1 cao <b>must be from correct figures used in a correct calculation</b>
				<b>Total 6 marks</b>

Question	Working	Answer	Mark	Notes
4.	$\left(\frac{h}{32}\right)^3 = \frac{500}{2000}$ or $\sqrt[3]{\frac{500}{2000}}$ oe or $\sqrt[3]{\frac{2000}{500}}$ or $\frac{2000}{500}$ or 4 or $\frac{500}{2000}$ or $\frac{1}{4}$ or 500 : 2000 oe or 2000 : 500 oe		3	M1 Accept 1.58(7401052.....) or 0.629(9605249.....) rounded or truncated to at least 3 SF
	Eg $(h =) \sqrt[3]{\frac{500}{2000}} \times 32^3$ or $\sqrt[3]{\frac{1}{4}} \times 32768$ or $\sqrt[3]{8192}$ or $\sqrt[3]{\frac{1}{4}} \times 32$ oe			M1 for any correct expression for $h$ .
		20.2		A1 for awrt 20.2
				<b>Total 3 marks</b>

Ques	Working	Answer	Mark	Notes
5. a	$\frac{CE}{17} = \frac{22.5}{9}$ oe or $22.5 \div 9 (=2.5)$ or $9 \div 22.5 (=0.4)$		2	M1 for correct scale factor
		42.5		A1 for 42.5 or $42\frac{1}{2}$
b	$\frac{AE}{10} = \frac{22.5}{9}$ $DE = 10 \times 2.5 - 10$ or $10 \times \frac{13.5}{9}$ or $10 \times 1.5$ oe		2	M1 for a complete method
		15		A1cao
c	$2.5^2 \times 36 (=225)$		3	M1 or for a fully correct method to find area of triangle ACE (height of triangle ABD = 4.2(3...)) height of triangle ACE = 10.5(8...))
	“225” – 36			M1 (dep)
		189		A1 cao
				<b>Total 7 marks</b>

Q	Working	Answer	Mark	Notes
6.	$345 \div 200 (=1.725)$ <b>or</b> $345 \times 100(=34500)$		3	M1 for a correct units conversion ( $\times 100$ ) <b>or</b> $\div 200$
	“1.725” $\times 100$ <b>or</b> “34500” $\div 200$			M1 for a correct units conversion ( $\times 100$ ) <b>and</b> $\div 200$
		172.5		A1 accept 173 if at least M1 awarded
				<b>Total 3 marks</b>

7.	(a)	$\frac{20}{8} \times 3$ oe		2	M1
			7.5		A1 oe
	(b)	$1875 \div \left(\frac{20}{8}\right)^3$ oe		2	M1 for $\left(\frac{20}{8}\right)^3$ or $\left(\frac{8}{20}\right)^3$ oe, accept ratios
			120		A1
		<b>Alternative</b>			
		$\frac{1875}{20} \times \left(\frac{8}{20}\right)^2 (=15)$ oe			M1
			120		A1
<b>Total 4 marks</b>					

8. (a)	Eg. — or - or 0.6 or — or - or 1.66(66...) or $\frac{MN}{13.5} = \frac{12}{12+8}$ oe or $(MN =) \text{—} \times 13.5$ oe	8.1	2	M1 for correct scale factor or correct equation involving $MN$ or correct expression for $MN$  Allow use of 1.66(66...) in place of - if rounded or truncated to at least 3 significant figures  A1 oe
(b)	Eg. — = — oe or — = — or $PQ = 9 \times \text{—}$ oe or $PQ = 9 \times \text{—}$ oe or $PQ = 15$ or — = — oe or $(LQ =) 9 \times \text{—}$ oe	6	2	M1 Correct expression for $PQ$ or $LQ$ (eg $9 \times \text{—}$ oe or $9 \times \text{—}$ oe) Correct equation involving $PQ$ or $LQ$ (eg — = — oe or — = — oe)  Allow use of 1.66(66...) in place of - or 0.666(66...) in place of - if rounded or truncated to at least 3 significant figures  A1
(c)		$\frac{25}{9}$ oe	1	B1 Accept $2\frac{7}{9}$ Accept 2.77(777...) rounded or truncated to at least 3 significant figures  Also accept $\left(\frac{20}{12}\right)^2$ or $\left(\frac{5}{3}\right)^2$

8. (d)	<p>Eg <math>105.6 - A = 105.6</math> or <math>A - 105.6 = 105.6</math> or</p> <p><math>A(105.6) = 105.6</math> or <math>105.6 = 105.6 + A</math> or</p> <p><math>105.6 = A</math></p> <p><math>(A =) \frac{105.6}{-1}</math> or <math>(A =) 105.6</math> or <math>(A =) 105.6</math></p>	59.4	3	<p>M1 For a correct equation involving A ft from part (c)</p> <p>M1 For correct expression for A. ft from part (c) Decimal values should be rounded or truncated correct to at least 3SF</p> <p>A1 oe</p>
<b>Total 8 marks</b>				

9. (a)	$5 \times \frac{10}{4}$ oe	12.5	2	<p>M1</p> <p>A1</p>
(b)	$18 \div \frac{10}{4}$ oe	7.2	2	<p>M1</p> <p>A1</p>
(c)		$6.25T$	1	<p>B1 Accept <math>T \times \left(\frac{10}{4}\right)^2</math></p>
<b>Total 5 marks</b>				