

Similarity

Mark Scheme 1

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Topic	Shape, Space and Measures
Sub Topic	Similarity
Booklet	Mark Scheme 1

Time Allowed: 60 minutes

Score: /50

Percentage: /100

Grade Boundaries:

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

Question Number	Working	Answer	Mark	Notes
1. (a)	$\frac{BC}{5.2} = \frac{9}{6}$ oe		2	M1 for correct, relevant proportionality statement with 3 values substituted
		7.8		A1 cao
(b)	$\frac{CE}{7.2} = \frac{6}{9}$ oe or $\frac{CE}{6} = \frac{7.2}{9}$ oe or $\frac{CE}{7.2} = \frac{5.2}{7.8}$ oe or $\frac{CE}{5.2} = \frac{7.2}{7.8}$ oe		2	M1 for correct, relevant proportionality statement with 3 values substituted
		4.8		A1 cao
				Total 4 marks

2.	7×3^2	63	2	M1 for 3^2 or 9 or $\frac{1}{9}$ or $(\frac{1}{3})^2$ A1
				Total 2 marks

3. (a)	$6/9 \times 12$ oe	8	2	M1 e.g $12 \div 1.5$ A1
(b)	$9/6$ (or $12/8$) $\times 5$	7.5	2	M1 A1 cao
(c)	$1.5^2 \times 32$ (=72) oe "72" – 32	40	3	M1 M1 for 1.5^2 or $(2/3)^2$ M1 dep A1
				Total 7 marks

4.	(a)	$\frac{12}{3} \times 3.5$ or $\frac{15}{3} \times 3.5 - 3.5$		2	M1 for $\frac{12}{3}$ or 4 or $\frac{15}{3}$ or 5
			14		A1 cao
	(b)	scale factor = $\frac{15}{3}$ or 5 or $\frac{3}{15}$ or $\frac{1}{5}$		3	M1 for $\frac{15}{3}$ or 5 or $\frac{3}{15}$ or $\frac{1}{5}$
		$19 \div 5$ or $19 \times \frac{1}{5}$			M1 Also award for $19 \div 4$ or $19 \times \frac{1}{4}$ May be implied by 4.75
			3.8		A1 cao
4	(c)	“5” ² or “25”		2	M1 for squaring their scale factor (must be one of 5, 4, $\frac{1}{5}$, $\frac{1}{4}$) or for $\left(\frac{19}{3.8}\right)^2$ oe or for complete correct method of finding vert ht (h cm) of $\triangle ABC$ and vert ht (H cm) of $\triangle PQR$ eg $\frac{1}{2} \times "3.8" \times h = 2$ $h = \frac{4}{"3.8"}$ (1.0526...) $H = \frac{4}{"3.8"} \times "5"$ (5.2631...)
			50		A1 for 50 or for answer which rounds to 50.0 ft only from their scale factor of 4 ie if M1 scored for 4^2 or 16, award A1 for an answer of 32
Total 7 marks					

5.	(a)	$\frac{BC}{5.2} = \frac{7}{5.6}$ oe or $\frac{BC}{7} = \frac{5.2}{5.6}$ oe		2	M1	for correct, relevant proportionality statement with 3 values substituted
			6.5		A1	cao
	(b)	$\frac{DE}{7.5} = \frac{5.6}{7}$ oe or $\frac{DE}{5.6} = \frac{7.5}{7}$ oe or $\frac{DE}{5.2} = \frac{7.5}{"6.5"}$ oe or $\frac{DE}{7.5} = \frac{5.2}{"6.5"}$		2	M1	for correct, relevant proportionality statement with 3 values substituted
			6		A1	cao
	(c)	(scale factor) eg $\frac{7}{5.6}$ or $\frac{5.6}{7}$ or $\frac{4}{5}$ oe or $\frac{5}{4}$ oe (May be implied by second M1) allow ratio notation		3	M1	Also award M1 for ht of $\triangle CDE$ $= \frac{4}{5} \times \frac{21}{\frac{1}{2} \times 7.5}$ (= 4.48)
		(scale factor) ² eg $\left(\frac{4}{5}\right)^2$ oe or 0.64 or $\left(\frac{5}{4}\right)^2$ oe 1.5625 allow ratio notation			M1	Also award M1 for $\frac{1}{2} \times "6" \times "4.48"$
						M2 for eg. (Area $\triangle ABC$ =) $\frac{1}{2} \times 7 \times "6.5" \sin C = 21$ and (Area $\triangle CDE$ =) $\frac{1}{2} \times 5.2 \times 5.6 \sin C$
						Also award M2 for $s = \frac{5.2 + 5.6 + "6"}{2}$ (= 8.4) and Area = $\sqrt{"8.4"("8.4"-5.2)("8.4"-5.6)("8.4"-6)}$
			13.44		A1	Also accept 13.4 if both method marks scored
Total 7 marks						

6.	(a)	$\frac{PR}{5} = \frac{14}{8}$ or $\frac{PR}{14} = \frac{5}{8}$		2	M1 or for $5 \times \frac{14}{8}$ oe
			8.75		A1
	(b)	$\frac{14}{8}$ or $\frac{7}{4}$ or 1.75 or $\frac{8}{14}$ or $\frac{4}{7}$ or 0.571... (May be implied by second M1) Allow ratio notation		3	M1 Alternative method M1 for $\frac{1}{2} \times 8 \times 5 \times \sin A$ and $\sin A = 0.8$
		1.75^2 oe eg 3.0625, $\frac{49}{16}$ or $\left(\frac{4}{7}\right)^2$ oe eg $\frac{16}{49}$, 0.326... allow ratio notation			M1 M1 (dep) for $\frac{1}{2} \times 14 \times "8.75" \times 0.8$
			49		A1 cao SC : B1 for an answer of 28
Total 5 marks					

7.	(a)	$8 \times \frac{8}{5}$ oe		2	M1 A1
	(b)	12×1.6^2	12.8 oe	2	M1 M1 for $1.6^2 (=2.56)$ or $0.625^2 (=0.39..)$ or $\begin{pmatrix} 8 \\ 5 \end{pmatrix}^2 \begin{pmatrix} 64 \\ 25 \end{pmatrix}$ or $\begin{pmatrix} 5 \\ 8 \end{pmatrix}^2 \begin{pmatrix} 25 \\ 64 \end{pmatrix}$ or $0.5 \times 8 \times "12.8" \times \sin 36.9$ cao
Total 4 marks					

Question	Working	Answer	Mark	Notes
8. (a)	$7.2 \times \frac{2}{6}$ or $7.2 \div \frac{6}{2}$		2	M1
		2.4		A1 cao
(b)	scale factor = $\frac{8}{2}$ or 4 or $\frac{2}{8}$ or $\frac{1}{4}$		3	M1 for $\frac{8}{2}$ or 4 or $\frac{2}{8}$ or $\frac{1}{4}$
	3.7×4 or $3.7 \div \frac{1}{4}$			M1 (dep)
		14.8		A1 Cao SC: M1 for answer of 11.1
(c)	4^2 or $(8 \div 2)^2$ or $(2 \div 8)^2$ or $(1 \div 4)^2$		2	M1 or for complete correct method of finding vert ht (h cm) of $\triangle PQR$ and vert ht (H cm) of $\triangle ABC$ eg $\frac{1}{2} \times "14.8" \times h = 72$ $h = \frac{144}{"14.8"} (9.7297\dots)$ $H = \frac{144}{"14.8"} \div "4" (2.4324\dots)$
		4.5oe		A1 SC : M1 for an answer of 8
				Total 7 marks

9. □□□(a)	$14 \div 4$ oe	3.5	2	M1 A1
(b)	4 (cms) = 100 000 (cms) or 4 : 100 000 or $100\,000 \div 4$ or 1 (km) = 0.00004 (km) or $1 : 0.00004$ or “3.5” $\times 10^5 \div 14$	1 : 25 000	2	M1 A1 cao
				Total 4 marks

Question	Working	Answer	Mark	Notes
10.	3^2 or 9 $3^2 \times 4$	32	3	M1 3^2 used or identified as area scale factor M1 $3^2 \times 4$ or 9×4 or 36 or $3^2 \times 4 - 4$ or $(3^2 - 1) \times 4$ or 8×4 A1
				Total 3 marks