

1.	(a)	200.5... to 201	www 2	2	<b>M1</b> for $0.5 \times 24 \times 26 \sin 40$ oe <b>A1</b>
	(b)	17.2 (0....)	www 4	4	<b>M2</b> for $26^2 + 24^2 - 2 \times 26 \times 24 \cos 40$ <b>or M1</b> for $\cos 40 = \frac{26^2 + 24^2 - BD^2}{2 \times 24 \times 26}$ <b>A2 or A1</b> for 295.976..
	(c)	12.8 (12.77...)	www 4	4	<b>B1</b> for Angle $C = 110$ soi accept on diagram <b>M2</b> for $(BC) = \frac{24 \sin 30}{\sin 110}$ oe <b>or</b> <b>M1</b> $\frac{\sin 110}{24} = \frac{\sin 30}{BC}$ oe i.e. a correct implicit statement soi <b>A1</b>
	(d)	8.208 to 8.230	www 2	2	<b>M1</b> for their (c) $\times \sin 40$ oe
2.	(a)	(cos) $\frac{180^2 + 115^2 - 90^2}{2 \times 180 \times 115}$ 24.98 – 24.99		M2	<b>M1</b> for correct implicit expression $90^2 = \dots\dots$
	(b) (i)	125(.0....) ft		A2	<b>A1</b> for (cos) = 0.9064...
	(b) (ii)	305(.0....) ft		1ft	<b>ft</b> 150 – their (a)
	(c)	180sin (54.98 to 55) or 180cos (35 to 35.02) oe or 180sin (360 – their (b)(ii)) or 180cos(their (b)(i) – 90) oe 147(.4....) cao www 3		1ft	<b>ft</b> 180 + their (b)(i)
(d)	$\frac{90 \sin 30}{\sin 70}$ 47.9 (47.88 – 47.89) cao www 3		M2	<b>B1</b> for 54.98 to 55 or 35 to 35.02 soi in correct position. Provided either angle is acute	
				A1	<b>M1</b> for $\frac{TR}{\sin 30} = \frac{90}{\sin 70}$ or other correct implicit equation
				A1	
3.	(a)	5.83 (5.830 to 5.831)		2	<b>M1</b> for $3^2 + 5^2$ Any other method must be complete
	(b)	113. 6 (114 or 113.5 to 113.6) www 4		4	<b>M2</b> for $(\cos C) = \frac{5^2 + 8^2 - 11^2}{2 \times 5 \times 8}$ <b>or M1</b> for correct implicit expression <b>A2</b> ( <b>A1</b> for $-0.4$ or $-\frac{2}{5}$ )
	(c)	25.8 (25.77 to 25.85) cao www 3		3	<b>M1</b> for $0.5 \times 5 \times 8 \times \sin$ (their angle $C$ ) o.e must be full method e.g. Hero's formula. <b>M1</b> for $0.5 \times 3 \times 5$ oe

4.

<p>(a) (i) 13 cao www</p> <p>(ii) 10.39 to 10.4 www</p> <p>(iii) 57.76 to 57.81 www</p> <p>(iv) 655 to 655.4</p> <p>(b) (i) 163.5 to 164 www</p> <p>(ii) 100.8 to 100.9 or 101 www</p>	<p>2 M1 for <math>\frac{PQ}{19.5} = \frac{11}{16.5}</math> oe or sf = 2/3 or 1.5 seen or correct trig</p> <p>3 M2 for <math>\sqrt{19.5^2 - 16.5^2}</math> or explicit trig or M1 for <math>x^2 + 16.5^2 = 19.5^2</math> or implicit trig</p> <p>2 M1 for <math>\sin = \frac{16.5}{19.5}</math> oe</p> <p>2 M1 for <math>0.02 \times (32)^3</math></p> <p>4 M2 for <math>67^2 + 105^2 - 2 \times 67 \times 105 \cos 143</math> or M1 for implicit form A1 for 26732 to 26896</p> <p>4 B1 for (DEF =) <math>78^\circ</math> May be on diagram and M2 for <math>\frac{105 \times \sin 70}{\sin \text{their } 78}</math> provided their <math>78 \neq 32</math> or 70 or M1 for <math>\frac{EF}{\sin 70} = \frac{105}{\sin \text{their } 78}</math> oe their <math>78 \neq 32</math> or 70</p>
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5.

<p>(a) (i) <math>5480^2 + 3300^2 - 2 \times 5480 \times 3300 \times \cos 165</math></p> <p>8709.5..</p> <p>(ii) <math>(\sin L =) \frac{\sin 165}{8710} \times 3300</math></p> <p>(0.09806...)</p> <p>5.6 (5.62 to 5.63)</p>	<p>M2 (75 856 005) M1 for implicit version</p> <p>E2 If E0, A1 for 75800000 to 75900000</p> <p>M2 M1 for <math>\frac{\sin L}{3300} = \frac{\sin 165}{8710}</math> oe (allow 8709.5.) Could use cosine rule using 8710 or better – M2 for explicit form or M1 for implicit form (allow 5.6 to 5.63 for A mark)</p> <p>A1 www3</p>
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6.

<p>(a) <math>(\cos Q =) \frac{4^2 + 4.5^2 - 7^2}{2 \times 4 \times 4.5}</math> o.e.</p> <p>110.74....</p> <p>(b) <math>(RS =) \frac{7 \sin 40}{\sin 85}</math></p> <p>4.516 ...</p> <p>(c) Angle <math>R = 55^\circ</math>  <math>0.5 \times 7 \times 4.52 \times \sin(\text{their } 55)</math> o.e.  <math>0.5 \times 4 \times 4.5 \times \sin 110.7</math> o.e.          Triangle <math>PRS</math> + Triangle <math>PQR</math>          21.4 (21.36 – 21.42)</p>	<p>M2 M1 for <math>7^2 = 4^2 + 4.5^2 - 2 \times 4 \times 4.5 \times \cos(Q)</math></p> <p>E2 If E0 then A1 for – 0.354(1....)</p> <p>M2 M1 for <math>\frac{RS}{\sin 40} = \frac{7}{\sin 85}</math> o.e.</p> <p>E1 Can be implied by second M</p> <p>B1 (May be seen on diagram)</p> <p>M1 (12.95 – 13.0) their 55 is (180 – 40 – 85)</p> <p>M1 (8.418 – 8.42) (<math>s = 7.75</math>)</p> <p>M1 Dependent on M1, M1</p> <p>A1 www 5</p>
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