

Topic 20 Further trigonometry (Post-TT) [34] MARKSCHEME

1.

150° seen B1

$4.5^2 + 6.2^2 - 2 \times 4.5 \times 6.2 \times \cos 150^\circ$ M1
Can be scored from correct use of incorrect angle

$\sqrt{\text{(their 107)}}$ M1
As for first M1

10.3(4...) A1

[4]

2.

$(AC^2 =) 20^2 + 14^2 (=596)$ M1
Or $10^2 + 7^2$

$\sqrt{\text{their 596}} (= 24.4)$ *Or $\sqrt{149}$*

$\frac{1}{2}(\text{their 24.4}) \div 16 = \cos \theta$ M1 dep
Dependent on both previous M1s

0.763 or 0.7629... or 0.7625 A1

40.27 to 40.54 A1

[5]

3.

(a)	3 hours 12 minutes	6 2 A01.3b 2 A03.1d 1 A03.2 1 A03.3	M2 for $[AC^2]$ $= 2.8^2 + 6.2^2 - 2 \times 2.8 \times 6.2 \times \cos 95$ Or M1 for attempt to use cosine rule AND A1 for $[AC =] 7.02$ M2 for $(2.8 + 6.2 + \text{their } 7.02) \div 5$ Or M1 for attempt at <i>their</i> distance $\div 5$	
(b)	Any sensible assumption about distance, speed or time	1		e.g. he walks in a straight line e.g. he doesn't have a rest
	Any sensible explanation	1 2 A03.5		e.g. underestimate so time would be longer

4.

(i) $\frac{1}{2}$ [A1]

(ii) $-\frac{1}{2}$ [A1]

5.

Sight of sin M1

$TQ = 2.5/\sin 6^\circ$ M1

$= 23.9(16\dots)$

their $23.9^2 + 3.8^2$ M1 dep

$= 586(.459\dots)$ or $585(.65)$

$\sqrt{\text{(their 586)}}$ M1

24(2\dots) A1

[5]

Alternative method

$QR = 2.5/\tan 6^\circ$ M1

$= 23.7(85\dots)$

their $23.7^2 + 3.8^2$ M1

$= 580(.209\dots)$

their $580 + 2.5^2$ M1 dep

$= 586(.459\dots)$ or $585(\dots)$

$\sqrt{\text{(their 586)}}$ M1

24(2\dots) A1

6.

$AC^2 = 7^2 + 92 - 2 \times 7 \times 9 \times \cos 75$ M1

$AC^2 = 97\dots\dots$, $AC = 9.9, 9.86\dots\dots$ A1

Their $AC^2 - 6^2$ M1

AC^2 must be $> 36 = 61.38888$ if correct

$DC = 7.8(3\dots)$ A1 ft

Answer must be accurate to 2 sf or better

Perimeter = 29.8(\dots) A1 ft

ft their DC + 22 but both Ms must be awarded.

[5]

7.

<p>140.76 or 140.8 or 141</p>	<p>5 1 AO1.3b 3 AO3.1b 1 AO3.2</p>	<p>M2 for $\frac{12.4 \times \sin 63}{\sin 58}$ oe (13.028) or</p> <p>M1 for $\frac{12.4}{\sin 58} = \frac{[\dots]}{\sin 63}$ oe</p> <p>M2 for [cos x =] $8.2^2 + 5.6^2 - (\text{their } 13.028)^2 + (2 \times 8.2 \times 5.6)$ or</p> <p>M1 for $(\text{their } 13.028)^2 = 8.2^2 + 5.6^2 - 2 \times 8.2 \times 5.6 \times \cos x$</p>
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