Question	Answer	Mark	Comments
1	**Alternative method 1**		
	$\cos 39 = \frac{x}{20}$ or $20 \times \cos 39$	M1	oe eg $\sin (90 - 39) = \frac{x}{20}$ or $\sin 51 = \frac{x}{20}$ or $20 \times \sin 51$
	15.5(4…)	A1	allow 16 with M1 seen
	Alternative method 2		
	$20^2 - (20 \times \sin 39)^2$	M1	oe eg $20^2 - (20 \times \cos 51)^2$
	15.5(4…)	A1	allow 16 with M1 seen
	Additional Guidance		
	$\cos = \frac{x}{20}$ unless recovered		M0
	20×0.78		M1
	20×0.78 with an answer of 16		M1A1
	20×0.78 with an answer of 15.6		M1A0
	20×0.77		M1
	20×0.77 with an answer of 16		M1A1
	20×0.77 with an answer of 15.4		M1A0
	cos (39 × 20 unless recovered		M0
	Answer from scale drawing with no trigonometry		M0A0

Question	Answer	Mark	Comments
2	**Alternative method 1**		
	$\sin 30 = \frac{x}{10}$ or $(x =)\ 10 \sin 30$	M1	oe eg $\frac{x}{\sin 30} = \frac{10}{\sin 90}$
	$\sin 30 = 0.5$	M1	oe may be seen in a table $0.5 = \frac{x}{10}$ oe scores M1M1
	5	A1	
	Alternative method 2		
	Correct trigonometric method to show that the length of the missing side is $5\sqrt{3}$	M1	oe
	$\sqrt{(5\sqrt{3})^2 + x^2} = 10$	M1dep	oe
	5	A1	
	Additional Guidance		
	Accept use of cos 60 instead of sin 30		

Q	Answer	Mark	Comments
3	**Alternative method 1**		
	tan identified	M1	oe eg $\tan^{-1}$
	$\tan x = \frac{10}{4}$ or $\tan x = \frac{5}{2}$ or $\tan x = 2.5$	M1dep	oe eg $\tan^{-1}\frac{10}{4}$ or $90 - \tan^{-1}\frac{4}{10}$
	[68, 68.2]	A1	SC1 [21.8, 22]
	Alternative method 2		
	$\sin x = \frac{10}{\sqrt{4^2+10^2}}$ or $\cos x = \frac{4}{\sqrt{4^2+10^2}}$	M2	oe eg $\sin x = \frac{10}{\sqrt{116}}$ or $\sin^{-1}\frac{10}{\sqrt{4^2+10^2}}$ or $\cos x = \frac{4}{\sqrt{116}}$ or $\cos^{-1}\frac{4}{\sqrt{4^2+10^2}}$ or $90 - \sin^{-1}\frac{4}{\sqrt{4^2+10^2}}$ or $90 - \cos^{-1}\frac{10}{\sqrt{4^2+10^2}}$
	[68, 68.2]	A1	SC1 [21.8, 22]
	Additional Guidance		
	Accept 10.77 or 10.8 or $2\sqrt{29}$ for $\sqrt{116}$		
	Tan can be identified by, for example, circling TOA in SOHCAHTOA		
	Answer from accurate drawing		M0M0A0
	$\sin x = \frac{10 \sin 90}{\sqrt{116}}$		M2
	$(x =)$ tan 2.5 or $(x =)$ tan 0.4 or $(x =) \tan\left(\frac{10}{4}\right)^{-1}$ unless recovered		M1M0A0
	$\tan = \frac{10}{4}$ or $\tan = \frac{4}{10}$ or $\tan x = \frac{4}{10}$ with no further correct working		M1M0A0

Q	Answer	Mark	Comments
4	**Alternative method 1 – using tangent of an angle**		
	tan chosen or used	M1	
	$\tan 58 = \frac{x}{46}$ or $46 \times \tan 58$ or $\tan 32 = \frac{46}{x}$ or $\frac{46}{\tan 32}$	M1dep	oe
	[73.6, 74]	A1	
	Alternative method 2 – finding hypotenuse first		
	$\frac{46}{\cos 58}$ or $\frac{46}{\sin 32}$ or 86.8(...) or 87	M1	oe
	$\sqrt{(\text{their } 86.8(...))^2 - 46^2}$ or $\sqrt{5418.(...)}$ or their 86.8(…) × sin 58 or their 86.8(…) × cos 32	M1dep	oe
	[73.6, 74]	A1	
	Additional Guidance		
	Do not accept scale drawing		
	Answer 73 after answer in range seen		M1M1A1
	$\frac{\sin 32}{46} = \frac{\sin 58}{x}$		M1

Q	Answer	Mark	Comments
5	cos identified or sin 30 identified	M1	oe
	(cos 60 =) $\frac{1}{2}$ or (sin 30 =) $\frac{1}{2}$	M1	oe may be seen in a table
	4	A1	
	Additional Guidance		
	Check diagram for working 4 written next to the x on the diagram is full marks unless contradicted		
	Cos can be identified by, for example, CAH circled in SOHCAHTOA		
	8 cos 60 $8 \times \frac{1}{2}$		M1M0 M1M1
	Answer 4 from creating an equilateral triangle		M1M1A1
	Answer only 4		M1M1A1
	Answer 4 from drawing a scale or full-sized diagram of the right-angled triangle		M0A0