	3D Pythagoras and Trigonometry Mark Scheme:	
1(a)	$CH^2 = 12^2 + 3^2$ $CH^2 = 144 + 9$ $CH^2 = 153$ $CH = \sqrt{153}$	[1 Mark]
	$CH = 12.37\ cm\ (2dp)$	[1 mark]
1(b)	$CE^2 = 12.37^2 + 4^2$ $CE^2 = 153.01 + 16$ $CE^2 = 169.01$ $CE = \sqrt{169.01}$	[1 mark]
	$CE = 13.00\ cm\ (2dp)$	[1 mark]
2(a)	$CA^2 = 5^2 + 7^2$ $CA^2 = 25 + 49$ $CA^2 = 74$ $CA = \sqrt{74}$	[1 mark]
	$CA = 8.60\ (2dp)$ $XY = CA = 8.60\ m$	[1 mark]
2(b)	$CX^2 = 5^2 + 8.6^2$ $CX^2 = 25 + 73.96$ $CX^2 = 98.96$ $CX = \sqrt{98.96}$	[1 mark]
	$CX = 9.95\ cm\ (2dp)$	[1 mark]
3(a)	$AC^2 = 12^2 + 12^2$ $AC^2 = 144 + 144$ $AC^2 = 288$ $AC = \sqrt{288}$	[1 mark]
	$AE^2 = 10^2 + (\frac{\sqrt{288}}{2})^2$ $AE^2 = 100 + 72.08$ $AE^2 = 172.08$ $AE = \sqrt{172.08}$ $AE = 13.11\ cm\ (2dp)$ Allow 13.12 due to early rounding	[1 mark]
3(b)	$\cos(A) = \frac{(13.11^2 + 13.11^2) - 12^2}{2 \times 13.11 \times 13.11}$ $\cos(A) = 0.581\ldots$	[1 mark]
	$\cos^{-1}(0.581\ldots)$ Exact answer = $54.45°$ Allow $54.47°$ for using rounded answer to part (a)	[1 mark]

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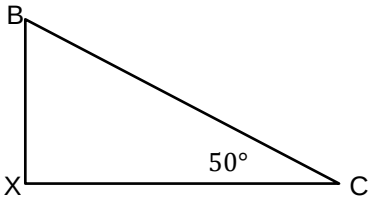
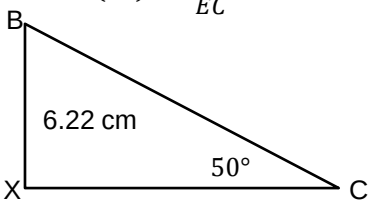
4	$\cos(50) = \frac{4}{BC}$ $BC = \frac{4}{\cos(50)}$ $BC = 6.22\ cm$  4cm	[1 mark]
	$\sin(40) = \frac{6.22}{EC}$  4cm	[1 mark]
	$EC = \frac{6.22}{\sin(40)}$ $EC = 9.68\ cm$	[1 mark]
5	$\cos(30) = \frac{1}{AX}$ $AX = \frac{1}{\cos(30)}$ $AX = \frac{2\sqrt{3}}{3}\ cm$	[1 mark]
	$XD^2 = 2^2 - \left(\frac{2\sqrt{3}}{3}\right)^2$ $XD^2 = 2^2 - \left(\frac{2\sqrt{3}}{3}\right)^2$ $XD^2 = 4 - \frac{4}{3}$ $XD^2 = \frac{8}{3}$	[1 mark]
	$XD = \sqrt{\frac{8}{3}} = 1.63\ m\ (2dp$	[1 mark]

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6	$\cos(75) = \frac{3.5}{BC}$ $BC = \frac{3.5}{\cos(75)}$ $BC = 13.52\ cm$	[1 mark]
	$CF = \frac{13.53}{\tan(25)}$ $CF = 29.00\ cm$	[1 mark]
	$area\ of\ ABC = \frac{1}{2}absin(c)$ $\frac{1}{2} \times 13.52 \times 7\ \times \sin(75)$ $Area = 45.71\ cm^2$	[1 mark]
	$Area\ of\ face\ \times Length$ $45.71\ \times 29.00 = 1325.81\ cm^3$	[1 mark]
7	$\tan(30) = \frac{AB}{4}$ $AB = 4 \times \tan(30) = \frac{4\sqrt{3}}{3}$ $AD = 2AB = 2 \times \frac{4\sqrt{3}}{3} = \frac{8\sqrt{3}}{3}$	[1 Mark]
	$\cos(30) = \frac{4}{AC}$ $AC = \frac{4}{\cos(30)} = \frac{8\sqrt{3}}{3}$	[1 mark]
	$DC^2 = \left(\frac{8\sqrt{3}}{3}\right)^2 + \left(\frac{8\sqrt{3}}{3}\right)^2$ $DC^2 = \frac{128}{3}$ $DC = \frac{8\sqrt{6}}{3}$	[1 mark]
	$DX = DC \div 2 = \frac{4\sqrt{6}}{3}$ $AX = BX = DX = CX$	[1mark]

END

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