	Sine & Cosine Rule Mark Scheme	
1		[1] Identifying angles correctly
	$\dfrac{AE}{\sin(136)} = \dfrac{3}{\sin(13)}$	[1] Correct use of sine rule
	$AE = 9.2641\ldots$	[1] Finding length AE
	$\sin 31 = \dfrac{EC}{9.2641\ldots}$	[1] Correct use of sine rule
	$\therefore EC = 4.7714\ldots$ EC = 5 cm	[1] Answer to nearest cm
2	$\cos(CDB) = \dfrac{6^2 + 5^2 - 7^2}{2(6)(5)}$	[1] Correct use of cosine rule
	$\cos(CDB) = 0.2$	[1] Calculation
	$CDB = 78.4630°$ $\therefore ADB = 101.547\ldots$	[1] Simplifying and use of angles on a straight line add up to 180°
	$\dfrac{x}{\sin(101.547)} = \dfrac{5}{\sin(30)}$	[1] Correct use of sine rule
	$x = 9.8\text{ cm (1 dp)}$	[1] Final answer
3		[1] Finding angle $BAC = 140$
	$\dfrac{120}{\sin(140)} \times \sin(18) = 57.6894\ldots\text{ m}$	[1] Correct use of sine rule to find length AB
	$h = 57.69 \times \sin(22) = 21.61\text{ m}$	[1] Correct use of right angled triangle, either trig or sine rule.
	$h = 22\text{ m}$	[1] Answer to the nearest meter

4	$$\frac{\sin ADB}{5.3} = \frac{\sin 70}{6.2}$$ $$ADB = 53.445\ldots$$	[1] Correct use of sine rule
	$$\therefore DBA = 56.555\ldots$$ $$\frac{AD}{\sin(56.555\ldots)} = \frac{6.2}{\sin(70)}$$ $$\therefore AD = 5.5053\ldots$$	[1] Apply sine rule twice for value of AD
	$$\frac{\sin BDC}{6.4} = \frac{\sin 50}{6.2}$$ $$\therefore BDC = 52.256\ldots$$	[1] Similarly apply sine rule on second triangle
	$$DBC = 77.74382\ldots$$ $$\frac{DC}{\sin(77.74382\ldots)} = \frac{6.2}{\sin(50)}$$ $$\therefore DC = 7.9190\ldots$$	[1] Finally apply a fourth time to get DC
	Hence perimeter is $5.3 + 6.4 + 5.5053\ldots + 7.9190\ldots$ $= 25$ m	[1] Correct value for perimeter
5	$$\frac{BD}{\sin(47°)} = \frac{7.9}{\sin(71°)}$$	[1] Use of sine rule to find length BD
	$$BD = \frac{7.9}{\sin(71°)} \times \sin(47°) = 6.11 \ (2 \text{ d.p.})$$	[1] Correct length BD
	$$\cos(x°) = \frac{5.1^2 - 6.2^2 - 6.1^2}{-2 \times 6.2 \times 6.1} = \frac{-49.64}{-75.64}$$	[1] Use of cosine rule
	$$\cos(x°) = 0.656 \ (3 \text{ d.p.})$$	[1] Simplifying
	$$x = 48.98°$$	[1] Correct value of x to 2 decimal places
6(a)	$$182.3^2 = 180^2 + 170^2 - 2(180)(170)\cos EOD$$	[1] Cosine rule
	$$\cos EOD = \frac{180^2 + 170^2 - 182.3^2}{2(180)(170)}$$ $$\cos EOD = 0.4586\ldots$$ $$\therefore EOD = 62.7023°\ldots$$	[2] Correct angle
	$$DE^2 = 370^2 + 480^2 - 2(370)(480)\cos(62.702\ldots)$$ $$\therefore DE = 452 \text{ m}$$	[1] Apply cosine rule again
6(b)	$$\frac{\sin ODE}{480} = \frac{\sin 62.7023°}{452.11\ldots}$$	[1] Correct application of sine rule
	$$\therefore ODE = 71°\ldots$$	[2] Final answer

END