Qu numb	Scheme	Marks
5 (a)	Applies Pythagoras Theorem $5^2+15^2=250 \Rightarrow 5\sqrt{10}\,(=AC)$ $\Rightarrow \angle ABC = 90^{\circ}$ *	M1 A1cso (2)
	ALT $\cos\angle ABC = \dfrac{15^2+5^2-250}{2\times15\times5}=0$ $\Rightarrow\ \angle ABC = 90^{\circ}$ *	{M1 A1}(2)
(b)	$DC=\sqrt{5^2+10^2}\left(=5\sqrt{5}\right)$ and $DA=\sqrt{15^2+10^2}\left(=5\sqrt{13}\right)$	B1B1
	$\angle DAC = \cos^{-1}\left(\dfrac{\left(5\sqrt{13}\right)^2+\left(5\sqrt{10}\right)^2-\left(5\sqrt{5}\right)^2}{2\times5\sqrt{13}\times5\sqrt{10}}\right)=37.874...\approx37.9^{\circ}$	M1A1cao (4)
(c)	$\angle BCA = \tan^{-1}\left(\dfrac{15}{5}\right)=71.5650...^{\circ}$ or find $\angle BAC=\tan^{-1}\left(\dfrac{5}{15}\right)=18.43^{\circ}$ $XB = 5\sin 71.565 = 4.74341...$ $\quad XB=5\cos18.43=4.743...$ Required angle $\angle DXB = \tan^{-1}\left(\dfrac{10}{4.74341}\right)=64.6230...^{\circ}\approx64.6^{\circ}$	M1 dM1 M1A1cao (4) [10]
	Alternatives:	
ALT 1	Δs ABC and BCX are similar $\Rightarrow \dfrac{BX}{5}=\dfrac{15}{5\sqrt{10}}\Rightarrow BX=\dfrac{15}{\sqrt{10}}$ M2 (may not be stated, just used) Find angle as main scheme M1A1	
ALT 2	Use area formula twice for triangle ABC $\dfrac{1}{2}AC\times BX=\dfrac{1}{2}AB\times BC\Rightarrow BX=\dfrac{15}{\sqrt{10}}$ M2 Find angle as main scheme M1A1	
ALT 3	DX is perpendicular to AX (Stated or used. No explanation/proof needed) $DX = AD\sin\angle DAC\ \left(=5\sqrt{13}\sin37.9...^{\circ}\right)$ M2 $\sin\angle DXB=\dfrac{10}{DX}\Rightarrow\angle DXB=64.6^{\circ}$ M1A1	

(a)		
M1	Use Pythagoras with correct signs in ΔABC or use cosine rule (formula correct) or any other complete method	
A1cso	Correct conclusion stated and no errors in their method	
(b)		
B1	Correct length of *DC* or *DA*	
B1	Second length correct	
M1	Use cosine rule in either form, formula must be correct, and reach a value for the size of $\angle DAC$	
A1cao	37.9° (Must be 1 dp)	
(c)		
M1	Use any trig ratio to obtain a value for the size of $\angle BCA$ (not nec correct)	
dM1	Use their value for $\angle BCA$ to obtain the length of *XB* Depends on the first M mark	
M1	Use $\tan DXB$ (or any other complete method) to obtain a value for the size of $\angle DXB$ (not nec correct)	
A1cao	64.6° Must be 1 dp unless rounding already penalised in (b)	
	For the alternatives:	
	Getting directly to *XB* or *DX* scores M2	
	Completion to the angle M1A1	