10	**(a)**	**(i)**	$\cos y = \frac{CD}{a}$ hence $CD = a\cos y$	**B1** **[1]**	**2.4**	Justification for CD	Need to see either $\cos y = \frac{CD}{a}$ or adj = hyp × $\cos\theta$ before given answer
		(ii)	area = $\frac{1}{2}AC.CD\sin x = \frac{1}{2}b\left(a\cos y\right)\sin x$ $= \frac{1}{2}ab\sin x\cos y$ **A.G.**	**B1** **[1]**	**2.4**	Use area of triangle to show given answer	Could quote general expression for area and then show clear substitution If not, then sides being used need to be clearly identified through statement or diagram Could also use right-angled triangle, with base as AD Condone not being rearranged to given expression
		(iii)	$CD = b\cos x$	**B1**	**2.1**	Correct CD in terms of b and x	

Question			Answer	Marks	AO	Guidance	
			Area BCD = $\frac{1}{2}BC.CD\sin y = \frac{1}{2}a\left(b\cos x\right)\sin y$ $= \frac{1}{2}ab\cos x\sin y$	**B1**	**2.1**	Correct area of triangle BCD	B0 B1 if correct area stated with no justification
			Area ABC = $\frac{1}{2}AC.BC\sin\left(x+y\right) = \frac{1}{2}ab\sin\left(x+y\right)$	**B1**	**1.1**	Correct area of triangle ABC	
			$\frac{1}{2}ab\sin\left(x+y\right) = \frac{1}{2}ab\sin x\cos y + \frac{1}{2}ab\cos x\sin y$ $\sin(x+y) = \sin x\cos y + \cos x\sin y$	**B1**	**2.1**	Equate area of ABC to the sum of the areas of the two small triangles and complete proof convincingly	Allow alternative proofs eg using lengths
				[4]			
	(b)		$\sin 30\cos\alpha + \cos 30\sin\alpha =$ $\cos 45\cos\alpha + \sin 45\sin\alpha$	**B1**	**1.1**	Correct use of compound angle formulae	Could be implied if exact values used immediately – allow BOD for RHS May be seen as two separate expressions, not yet equated
			$\frac{1}{2}\cos\alpha + \frac{1}{2}\sqrt{3}\sin\alpha = \frac{1}{2}\sqrt{2}\cos\alpha + \frac{1}{2}\sqrt{2}\sin\alpha$	**M1**	**1.1**	Use exact trig values	In either equation or two expressions Must see all 4 values, but expansions may not be fully correct
			$\left(\sqrt{3}-\sqrt{2}\right)\sin\alpha = \left(\sqrt{2}-1\right)\cos\alpha$ $\frac{\sin\alpha}{\cos\alpha} = \tan\alpha = \frac{\sqrt{2}-1}{\sqrt{3}-\sqrt{2}}$	**M1**	**3.1a**	Gather like terms and attempt $\tan\alpha$ May still have fractions in the fraction	$\tan\alpha$ does not yet need to be the subject, but must only appear once for M1
			$= \frac{\left(\sqrt{2}-1\right)\left(\sqrt{3}+\sqrt{2}\right)}{\left(\sqrt{3}-\sqrt{2}\right)\left(\sqrt{3}+\sqrt{2}\right)} = \frac{\sqrt{6}+2-\sqrt{2}-\sqrt{3}}{3-2}$	**M1**	**3.1a**	Attempt to rationalise their denominator	Clear intention seen to multiply throughout by the conjugate of their denominator
			$\tan\alpha = 2+\sqrt{6}-\sqrt{3}-\sqrt{2}$ **A.G.**	**A1**	**2.1**	Obtain given answer	With full detail, including (at least) 3 – 2 in denominator

Question			Answer	Marks	AO	Guidance	
				[5]			