Question	Answer	Marks	Guidance
	Attempt to resolve in any direction	**M1**	For resolving. Allow sin/cos mix. Allow sign error. Correct number of terms.
	$F\cos\alpha - 20\cos 40 - 100\sin 20 = 0$ [$F\cos\alpha = 15.320\ldots + 34.202\ldots = 49.5229\ldots$]	**A1**	
	$F\sin\alpha + 20\sin 40 - 100\cos 20 = 0$ [$F\sin\alpha = 93.969\ldots - 12.855\ldots = 81.1135\ldots$]	**A1**	
	$F = \sqrt{(49.5229\ldots)^2 + (81.1135\ldots)^2}$	**M1**	OE; Attempt to solve for F; one term missing in total
	$\alpha = \tan^{-1}\left(\frac{81.1135\ldots}{49.5229\ldots}\right)$	**M1**	OE; Attempt to solve for α; one term missing in total
	$F = 95(.0)$, $\alpha = 58.6$	**A1**	$F = 95.0364\ldots$ and $\alpha = 58.5943\ldots$
	Alternative mark scheme for question : For candidates who use cosine and/or sine rule		
	Attempt at cosine rule from triangle of forces	**M1**	Must use lengths 100 and 20 with a suitable angle
	$F^2 = 100^2 + 20^2 - 2\times 100\times 20\cos 70$	**A1**	Correct
	$F = 95[.0]$	**A1**	
	$\frac{95.0364}{\sin 70} = \frac{20}{\sin\beta}$ OR $\frac{95.0364}{\sin 70} = \frac{100}{\sin\gamma}$	**M1**	Attempt at sin rule
		A1	where $\beta = (70 - \alpha)$ where $\gamma = (40 + \alpha)$
	$\alpha = 58.6$	**A1**	$\alpha = 58.5943\ldots$

Question	Answer	Marks	Guidance
	Alternative mark scheme for question : For candidates who resolve in other directions		
	Attempt to resolve (e.g. parallel or perpendicular to 100 N)	**M1**	For resolving. Allow sin/cos mix. Allow sign error. Correct number of terms.
	$F\sin(\alpha+20)+20\sin 20-100=0 \quad [F\sin(\alpha+20)=93.159\ldots]$	**A1**	
	$F\cos(\alpha+20)-20\cos 20=0 \quad [F\cos(\alpha+20)=18.793\ldots]$	**A1**	
	$F=\sqrt{93.159\ldots^2+18.793^2}$	**M1**	OE; Attempt to solve for F; one term missing in total
	$\alpha=\tan^{-1}\left(\frac{93.159\ldots}{18.793\ldots}\right)-20$	**M1**	OE; Attempt to solve for α; one term missing in total
	$F = 95[.0]$, $\alpha = 58.6$	**A1**	$F = 95.0364\ldots$ and $\alpha = 58.5943\ldots$
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