3	For attempt to resolve in any direction to form an equation or expression
	Vertically: $(Y=)\ \pm\left(45+28\sin 35-72\sin 50-35\sin 60\right)$
	Horizontally: $(X=)\ \pm\left(28\cos 35+72\cos 50-35\cos 60\right)$
	$R=\sqrt{(\textit{their}\,24.4059...)^2+(\textit{their}\,51.7169...)^2}$
	$\theta=\tan^{-1}\left(\dfrac{\textit{their}\,24.4059...}{\textit{their}\,51.7169...}\right)\left[=\tan^{-1}0.4719...\right]$ OR $\alpha=\tan^{-1}\left(\dfrac{\textit{their}\,51.7169...}{\textit{their}\,24.4059...}\right)\left[=\tan^{-1}2.1190...\right]$
3	$R=57.2$ N Direction is 25.3° below the positive x-direction or bearing 115°

7(a)	For attempt to resolve in any direction to form an expression or equation
	$[X =] \pm (30\cos 30 + 15\cos 45 - 20\cos 20)$ OR $[S\cos\alpha =] \pm (30\cos 30 + 15\cos 45 - 20\cos 20)$
	$[Y =] \pm (25 + 15\sin 45 - 20\sin 20 - 30\sin 30)$ OR $[S\sin\alpha =] \pm (25 + 15\sin 45 - 20\sin 20 - 30\sin 30)$
	$S = \sqrt{(\textit{their}\,17.7935\ldots)^2 + (\textit{their}\,13.76661\ldots)^2}$ OR $S = \dfrac{\textit{their}\,17.7935\ldots}{\cos(\textit{their}\,37.7278\ldots)}$ OR $S = \dfrac{\textit{their}\,13.76661\ldots}{\sin(\textit{their}\,37.7278\ldots)}$
	$\alpha = \tan^{-1}\left(\dfrac{\textit{their}\,13.7661\ldots}{\textit{their}\,17.7935\ldots}\right)$ OR $\alpha = \cos^{-1}\left(\dfrac{\textit{their}\,17.7935\ldots}{\textit{their}\,22.4970\ldots}\right)$ OR $\alpha = \sin^{-1}\left(\dfrac{\textit{their}\,13.7661\ldots}{\textit{their}\,22.4970\ldots}\right)$
	$[S =]$ 22.5 $[\alpha =]$37.7

7(b)	$(their\,17.7935\ldots) - F = 0.6a$ OR $30\cos 30 + 15\cos 45 - 20\cos 20 - F = 0.6a$ OR $(their\,S)\cos(their\,\alpha) - F = 0.6a \quad [17.8025 - F = 0.6a]$
	$2 = 0 + \frac{1}{2}a \times 3^2 \quad \left[a = \frac{4}{9}\right]$
	$R = their\,(13.7661\ldots) + 0.6g \quad [= 19.7661\ldots]$ OR $R = 25 + 15\sin 45 - 20\sin 20 - 30\sin 30 + 0.6g$ OR $R = (their\,S)\sin(their\,\alpha) + 0.6g \quad [R = 13.759 + 0.6g]$
	$(their\,17.7935)\ldots - \mu \times 19.7661 = 0.6 \times \left(their\,\frac{4}{9}\right)$
	$\mu = 0.887$

7(b)	**Alternative scheme for using energy**
	$\frac{1}{2}\times 0.6\times v^2 = (\mathit{their}\,17.7935)\times 2 - F\times 2$ OR $\frac{1}{2}\times 0.6\times v^2 = (30\cos 30 + 15\cos 45 - 20\cos 20)\times 2 - F\times 2$ OR $\frac{1}{2}\times 0.6\times v^2 = (\mathit{their}\ S)\cos(\mathit{their}\ \alpha)\times 2 - F\times 2$
	$2 = \frac{1}{2}(0+v)\times 3 \quad \left[v = \frac{4}{3}\right]$
	$R = \mathit{their}(13.7661\ldots) + 0.6g\ [= 19.7661\ldots]$ OR $R = 25 + 15\sin 45 - 20\sin 20 - 30\sin 30 + 0.6g$ OR $R = (\mathit{their}\ S)\sin(\mathit{their}\ \alpha) + 0.6g \quad [R = 13.759 + 0.6g]$
	$\frac{1}{2}\times 0.6\times\left(\mathit{their}\frac{4}{3}\right)^2 = (\mathit{their}\,17.7935)\times 2 - 19.7661\times\mu\times 2$
	$\mu = 0.887$

2	$P + 5\sin 60 - 10\sin 30 = 0$
	$P = 5 - 5\frac{\sqrt{3}}{2}$ or 0.670 [0.66987…]
	$Q = \pm(10\cos 30 - 5\cos 60)$
	$Q = 10\frac{\sqrt{3}}{2} - \frac{5}{2}$ or 6.16 [6.16025…]