Paper: 1MA1/1H

Question	Answer	Mark	Mark scheme	Additional guidance
21	–6, 3.5	P1	for process to find gradient of *PR* or *QR*, eg $\frac{k+3-5}{k--4}\left(=\frac{k-2}{k+4}\right)$ **or** $\frac{k+3--6}{k-6}\left(=\frac{k+9}{k-6}\right)$ **or** $\frac{5-(k+3)}{-4-k}\left(=\frac{2-k}{-4-k}\right)$ **or** $\frac{-6-(k+3)}{6-k}\left(=\frac{-9-k}{6-k}\right)$ **OR** for start of process to use Pythagoras, eg $PR^2 = (k--4)^2 + (k+3-5)^2$ **or** $RP^2 = (-4-k)^2 + (-5-(k+3))^2$ **or** $QR^2 = (k-6)^2 + (k+3--6)^2$ **or** $RQ^2 = (6-k)^2 + (-6-(k+3))^2$	Condone missing bracket for first P1 only Stating eg Grad *PR* = $\frac{k--4}{k+3-5}$ Or grad *QR* = $\frac{k-6}{k+3--6}$ scores P0 but check SC
		P1	for forming a correct equation, eg $\frac{k+3-5}{k--4}\times\frac{k+3--6}{k-6}=-1$ **or** $\frac{k-2}{k+4}\times\frac{k+9}{k-6}=-1$ **or** $\frac{5-(k+3)}{-4-k}\times\frac{-6-(k+3)}{6-k}=-1$ **or** $\frac{2-k}{-4-k}\times\frac{-9-k}{6-k}=-1$ oe **OR** $(k--4)^2 + (k+3-5)^2 + (k-6)^2 + (k+3--6)^2 = (-6-5)^2 + (6--4)^2$ **or** $(k+4)^2 + (k-2)^2 + (k-6)^2 + (k+9)^2 = (-11)^2 + 10^2$	
		P1	for writing in the form $ak^2 + bk + c$ (= 0), eg $2k^2 + 5k - 42$ (= 0) **or** $4k^2 + 10k - 84$ (= 0)	
		P1	(dep P3) for factorising, eg $(k+6)(2k-7)$ (= 0) **or** $(2k+12)(2k-7)$ **or** $(k+6)(4k-14)$ **OR** use of formula, eg $\frac{-5\pm\sqrt{5^2-4\times2\times-42}}{2\times2}$ **or** $\frac{-10\pm\sqrt{10^2-4\times4\times-84}}{2\times4}$	
		A1	cao SCB4 for correct answer coming from consistent use of reciprocals of gradients	