Question Number	Scheme	Notes	Marks
1(a)	$\{QR^2 =\}(2x)^2+(2x)^2$ Valid attempt at Pythagoras' Theorem. Condone omission of brackets e.g., $\{QR =\}\sqrt{2x^2+2x^2}$ If no sum seen only accept $\{QR^2 =\}8x^2$ or $\{QR =\}\sqrt{8x^2}$ or correct answer $\{QR =\}2\sqrt{2}x$ or $\sqrt{8}x$. If trig, must see a correct statement e.g., $\frac{2x}{QR}=\sin 45(^\circ)$		**M1**
	$\{QR =\}2\sqrt{2}x$ or $\sqrt{8}x$ not e.g., $\sqrt{8x^2}$ Allow e.g., $2x\sqrt{2},\ x\sqrt{8}$. Must be seen in part (a) and do not condone $\pm$ but allow all remaining marks to be scored		**A1**
			(2)
(b)	Question has: "Solutions relying on calculator technology are not acceptable"		
	$3(x+7)=4x+'2\sqrt{2}x'$ Sets perimeters equal e.g., $x+7+x+7+x+7=2x+2x+'2\sqrt{2}x'$ Allow kx or $kx^{\frac{1}{2}}$ or kx^2 or for $'2\sqrt{2}x'$ Allow the odd slip if the intention is clear e.g. $3(x+7)\rightarrow 3x+7$		**M1**
	$\Rightarrow(1+2\sqrt{2})x=21$ Collects terms in *x* and reaches $Ax=B$ where *A* is a rational number + a surd and *B* is a rational number. Could be implied by $x=$ an intermediate answer Must have had kx for $'2\sqrt{2}x'$		**dM1**
	Correct **intermediate** answer $x=\frac{21}{(1+2\sqrt{2})}$ or $x=\frac{21}{(1+\sqrt{8})}$ Implied by $-3+6\sqrt{2}$ provided there is some relevant minimal algebra		**A1**
	$\Rightarrow x=\frac{21}{(2\sqrt{2}+1)}\times\frac{(2\sqrt{2}-1)}{(2\sqrt{2}-1)}$ Any correct method seen to rationalise an expression of form $\frac{D}{C}$ where C is a rational number + a surd and *D* is a rational number. What is shown above is sufficient. Can be implied but not by just a calculator answer.		**M1**
	$\Rightarrow\{x =\}6\sqrt{2}-3$	$6\sqrt{2}-3$ or $-3+6\sqrt{2}$	**A1**

	Squaring both sides - example: $3(x+7)=4x+2\sqrt{2}x$ (M1) $\Rightarrow 2\sqrt{2}\,x=21-x\Rightarrow\left(2\sqrt{2}\,x\right)^2=(21-x)^2\Rightarrow 8x^2=441-42x+x^2\Rightarrow 7x^2+42x-441=0$ Squares and obtains a 3TQ (dM1) Correct 3TQ (A1) $\Rightarrow x^2+6x-63=0\Rightarrow x=\dfrac{-6\pm\sqrt{6^2-4(1)(-63)}}{2(1)}$ Solves via valid non-calculator method (M1) $\Rightarrow x=\frac{-6\pm\sqrt{288}}{2}\Rightarrow x=-3+6\sqrt{2}$ This answer only (A1)	**(5)**
		Total 7