Question Number	Scheme	Notes	Marks
1(a)	$ae=\frac{13}{2}$ **or** $\frac{a}{e}=\frac{72}{13}$	One correct equation in a and e. Allow equivalent correct equations. Could include – or $\pm$ signs	**B1**
	e.g., $a=\frac{72}{13}e\Rightarrow\frac{72}{13}e^2=\frac{13}{2}\Rightarrow e^2=...\quad\left(\frac{169}{144}\right)$ or $a=\frac{13}{2e}\Rightarrow\frac{13}{2e^2}=\frac{72}{13}\Rightarrow e^2=...\quad\left(\frac{169}{144}\right)$	Having obtained two equations in a and e of the correct form i.e., $ae=p$ and $\frac{a}{e}=q\quad p,\ q\neq 0,$ solves simultaneously to find a <u>positive</u> value for e^2 (no requirement for e > 1) or e. Condone poor algebra provided a value is obtained. May find a first.	**M1**
	$e=\frac{13}{12}$ or $1\frac{1}{12}$ or $1.08\dot{3}$. Not $\pm\frac{13}{12}$ unless negative value clearly rejected in this part.		**A1**
			(3)
(b)	$\left\{a=\frac{72}{13}\times\frac{13}{12}=6\ \text{ or }\ a=\frac{13}{2\left(\frac{13}{12}\right)}=6\right\}$ $b^2=a^2\left(e^2-1\right)=...$ $\left\{b^2=6^2\left(\left(\frac{13}{12}\right)^2-1\right)=\frac{25}{4}\ \text{ or }\ b=\frac{5}{2}\right\}$	With any value for a, which might be seen in part (a), and their e, **uses** a correct eccentricity formula with correct substitution to find a value for b^2 or b. Could be implied. May see $b=a\sqrt{e^2-1}$ or use of e.g., $e=\sqrt{1+\frac{b^2}{a^2}}$ or $e=\frac{c}{a}$ with $c=\sqrt{a^2+b^2}$	**M1**
	$\frac{x^2}{a^2}-\frac{y^2}{b^2}=1\Rightarrow\frac{x^2}{36}-\frac{y^2}{\frac{25}{4}}=1$	Applies $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ **correctly** for their values. Not dependent. Could use e.g., $b^2x^2-a^2y^2=a^2b^2$	**M1**
	e.g., $25x^2-144y^2=900$ A correct **equation** in correct form. Requires all previous 5 marks but allow if 4 marks with A0 in (a) for $e=\pm\frac{13}{12}$ and negative value not rejected in part (a). Any positive integer multiple. Allow equivalents provided variables on one side and constant on the other and y^2 term has negative coefficient. Just $p=25,\ q=144,\ r=900$ requires $px^2-qy^2=r$ to be seen. Ignore wrong values for p, q, r following a correct equation (e.g., "q = –144")		**A1**
Alt **Using** $PS^2=e^2PM^2$	$\left(x-\frac{13}{2}\right)^2+y^2=\left(\frac{13}{12}\right)^2\left(x-\frac{72}{13}\right)^2$ M1: Forms equation correct for their ae, e and $\frac{a}{e}$ $x^2-13x+\frac{169}{4}+y^2=\frac{169}{144}x^2-13x+36\Rightarrow\frac{25}{144}x^2-y^2=\frac{25}{4}$ M1: Expands and reaches $rx^2-sy^2=t,\ \ r,\ s,\ t\neq 0$ A1: e.g., $25x^2-144y^2=900$ as main scheme		
			(3)
			Total 6