Consider circular orbit of radius r_1. Then, from $m\vec{a} = \vec{F}$, one has

$$m\frac{v_1^2}{r_1} = \frac{mMG}{r_1^2} \Rightarrow v_1^2 = \frac{MG}{r_1} \Rightarrow \boxed{v_1 = \sqrt{\frac{MG}{r_1}}} \quad (i)$$

Similarly, for circular orbit of radius r_2,

$$v_2 = \sqrt{\frac{MG}{r_2}} \quad (ii)$$

Now consider the elliptic orbit. By the conservation of energy and angular momentum, these quantities have the same values at A and B. Consequently,

Energy conservation gives

$$\boxed{\frac{1}{2}mv_A^2 - \frac{mMG}{r_1} = \frac{1}{2}mv_B^2 - \frac{mMG}{r_2}} \quad (iii)$$