TUMBLR SHIT

DIDIGODOT

(1) $K = -\frac{1}{2}U_g$

Proof.

$$\begin{aligned} K &= \frac{1}{2}mv^2 \\ &= \frac{1}{2}m(\frac{2\pi r}{T})^2 \\ &= \frac{1}{2}m(\frac{2\pi r}{2\pi r\sqrt{\frac{r}{GM}}})^2 \\ &= \frac{1}{2}\frac{GMm}{r} \\ &= -\frac{1}{2}(-\frac{GMm}{r}) \\ &= -\frac{1}{2}U_g \end{aligned}$$

□

(2) $(r^{'} \times r^{''}) \times r^{'} = (r^{'} \cdot r^{'})r^{''} - (r^{'} \cdot r^{''}) \times r^{'}$