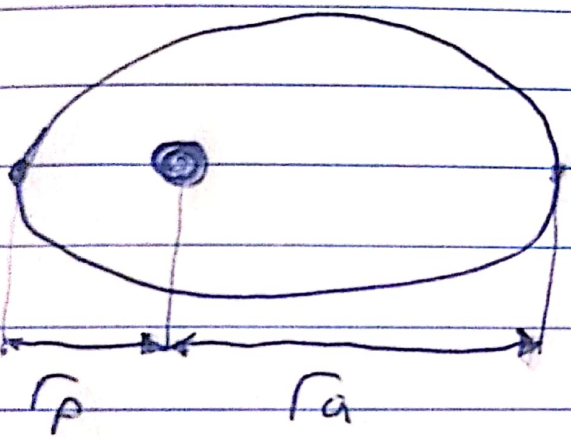
Date

20-P-FA-BK-010



for elliptical orbits,

$$r_a = \frac{r_p}{\frac{2GM}{r_p V_p^2} - 1}$$

given r_a, r_p, G, M

rearrange to get $V_p = \sqrt{\frac{2GMr_a}{r_p(r_p + r_a)}}$

$$V_a = V_p \cdot \frac{r_p}{r_a}$$