

36. From $F_{\text{grav}} = GMm/r^2 = mv^2/r$ we find $M \propto v^2$. Thus, the mass of the Sun would be

$$M'_s = \left(\frac{v_{\text{Mercury}}}{v_{\text{Pluto}}} \right)^2 M_s = \left(\frac{47.9 \text{ km/s}}{4.74 \text{ km/s}} \right)^2 M_s = 102M_s .$$