$$F_G$$

$$x = r\cos(\theta) \, and \, y = r\sin(\theta), r = \sqrt{x^2 + y^2}$$

$$1.5 \times 10^{11} \frac{M_e v^2}{r} = F = frac G M_0 M_E r^2$$
$$GM_= v^2 r$$
$$v = 2/years = 2\pi \, AU/years$$
$$GM_0 = v^2 r = 4\pi^2 \frac{(AU)^2}{yars^2}$$