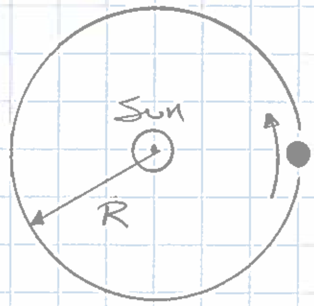


$R = 1.5\times10^{11}\,m$ ; Orbital Period, $T = 365$ days

NOTE: $T = 365\text{ days}\left(\frac{24\text{ hr}}{1\text{ day}}\right)\left(\frac{60\text{ min}}{1\text{ hr}}\right)\left(\frac{60\text{ s}}{1\text{ min}}\right)$
$= 3.153\times10^{7}\,s$

a.) for Uniform circular motion, speed, $v = $ const.

So $v = \frac{\text{distance}}{\text{time}} = \frac{2\pi R}{T} = \underline{2.989\times10^{4}\,m/s}$
$= \underline{29.89\,km/s}$

b.) $v = \omega R \Rightarrow \omega = \frac{v}{R} = \underline{1.992\times10^{-7}\,\frac{rad}{s}}$

c.) For UCM: $a_r = \frac{v^2}{r} = \underline{5.956\times10^{-3}\,m/s^2}$

Now, if you've seen some physics before, the gravitational acceleration is

$$a_g = \frac{F_g}{M_E} = \frac{1}{M_E}\,\frac{G M_{\odot} M_E}{R^2} = \frac{G M_{\odot}}{R^2}$$

$$= 5.929\times10^{-3}\,\frac{m}{s^2}$$

Newton used similar reasoning for the Moon's orbit to establish the $1/r^2$ nature of the gravitational force.