B) Determine the centripetal acceleration of the telescope

$F_g = F_c = ma_c$

$a_c = \frac{F_c}{m} = \frac{9.23 \times 10^4 N}{11,110 kg} = 8.31 m/s^2$

C) Determine the orbital speed of the telescope

$a_c = \frac{v^2}{r}$

$v = \sqrt{a_c r} = \sqrt{(8.31 m/s^2)(6.929 \times 10^6 m)} = 7.59 \times 10^3 m/s$

D) Convert the orbital speed to miles/hr. (1 hr = 3600 s, 1 mile = 1609 m)

$7.59 \times 10^3 \frac{m}{s} \left| \frac{3600 s}{1 hr} \right| \frac{1 mile}{1609 m} = 1.70 \times 10^4 MPH$

13. The magnitude of gravitational force between two objects is 20 N. If the mass of each object is doubled, the magnitude of the gravitational force between the objects is…

(1) 5 N (2) 10 N (3) 20 N (4) 80 N

$F_g = \frac{G m_1 m_2}{r^2} = \frac{(1)(2)(2)}{(1)^2} = 4 \times$ ORIGINAL

14. Gravitational force F exists between point objects A and B separated by a distance R. If the mass of A is doubled and distance R is tripled, by what magnitude will the gravitational force between A and B change?

$F_g = \frac{G m_1 m_2}{r^2} = \frac{(1)(2)(1)}{(3)^2} = 2/9 \times$

15. When a satellite is a distance R from the center of Earth, the force due to gravity on the satellite is F. By what magnitude will the force due to gravity on the satellite change when its distance from the center of Earth is tripled?

$F_g = \frac{G m_1 m_2}{r^2} = \frac{(1)(1)(1)}{(3)^2} = 1/9 \times$