PHYSIC HOMEWORK # 37

7a) $F_g = \frac{G \cdot m_1 \cdot m_2}{r^2} = \frac{(6.67\times10^{-11} \cdot 5.97\times10^{24} \cdot 550)}{(6.38\times10^{6} + 3.75\times10^{5})^2}$

$F_g = 4.8\times10^{3}\ N$

b) $V = \sqrt{\frac{G m_1}{r}} = \sqrt{\frac{6.67\times10^{-11} \cdot 5.97\times10^{24}}{6.755\times10^{6}}}$

$= 7.68\times10^{3}\ m/s$

Note: m_1 is the mass of the object (or planet) that the satellite is orbiting

r is the radius of the orbit

c) $a_c = \frac{v^2}{r} = \frac{(7.68\times10^{3})^2}{6.755\times10^{6}}$

$= 8.73\ m/s^2$

d) $T = 2\pi\sqrt{\frac{r^3}{G M_e}} = 2\pi\sqrt{\frac{(6.755\times10^{6})^3}{6.67\times10^{-11} \cdot 5.97\times10^{24}}}$

$= 5.50\times10^{3}\ s$