0. Derive the orbital velocity of a satellite around the earth (express it in terms of $G, m, R$).

1. Derive the escape velocity of a satellite around the earth (express it in terms of $G, m, R$).

2. Calculate the net force acting on $m_1$ for each case:
   - $m_1 = 10^{15}$ kg
   - $m_2 = 10^{8}$ kg
   - $m_3 = 10^{11}$ kg

   a)
   - Diagram showing $m_1$, $m_2$, and $m_3$ with distances $10^3$ m and $2.10^3$ m.

   b)
   - Diagram showing $m_1$, $m_2$, and $m_3$ with distances $10^3$ m and $2.10^3$ m.

   c)
   - Diagram showing $m_1$, $m_2$, and $m_3$ with distances $1.6$ m and $2.10^3$ m.
(2) Derive $g = 9.8 \text{ m/s}^2$ and obtain all necessary values from your book or the Web.

(5) Derive $g$ for the moon.