

$$F = \frac{G m_1 m_2}{d^2} \quad (3)$$

#8 Jupiter
 $r_J = 11 r_E$

$$m_J = 318 m_E$$

$$50 \text{ kg} = 490 \text{ N}$$

$$\frac{318}{11^2} \times 490$$

$$= \boxed{1.29 \times 10^3 \text{ N}}$$

9. $T = ?$

$$L = 1.0 \text{ m}$$

$$g = 9.8 \text{ m/s}^2$$

$$T = 2\pi \sqrt{\frac{L}{g}}$$

$$= 2\pi \sqrt{\frac{1}{9.8}}$$

$$\approx \boxed{2.5}$$

10.

$$T = 3.5 \text{ s}$$

$$L = 2 \text{ m}$$

$$g = ?$$

$$T = 2\pi \sqrt{\frac{L}{g}}$$

$$T = 2\pi \frac{\sqrt{L}}{\sqrt{g}} \cdot \sqrt{g}$$

$$\frac{T\sqrt{g}}{T} = \frac{2\pi\sqrt{L}}{T} \cdot \sqrt{g}$$

$$g = \left(\frac{2\pi\sqrt{L}}{T}\right)^2$$

$$= \frac{2(\pi)(\sqrt{2})^2}{T^2}$$

$$g = \boxed{6.5 \text{ m/s}^2}$$