

Date

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NIM: 21/479067/TK/52800

### Labsol I FFKG

1.  $m_1 = 50 \text{ kg}$

$m_2 = 100 \text{ kg}$

$r = 0,5 \text{ kg cm} = 5 \cdot 10^{-3} \text{ m}$

$F_g = ?$

$$F_g = \frac{G M_1 M_2}{r^2} = \frac{6,67 \cdot 10^{-11} \cdot 50 \cdot 100}{5 \cdot 10^{-3} \cdot 5 \cdot 10^{-3}} = 1,334 \cdot 10^{-2} \text{ N}$$

2.  $T_{Ax} = 12 \text{ jam}$

$2R_{Ax} = R_{Ay}$

$T_{Ay} = ?$

$$\frac{T_{Ax}^2}{R_{Ax}^3} = \frac{T_{Ay}^2}{R_{Ay}^3} \Rightarrow \frac{12^2}{R_{Ax}^3} = \frac{T_{Ay}^2}{8 R_{Ax}^3}$$

$$12^2 \cdot 8 = T_{Ay}^2$$

$$T_{Ay} = 12 \cdot 2\sqrt{2} = 24\sqrt{2} \text{ jam}$$

3. a. Tentukan kec. minimum peluru dg ketinggian =  $R_{Bumi}$

$R_{Bumi} = R_E = 6,38 \cdot 10^6 \text{ m}$

$M_E = 5,97 \cdot 10^{24} \text{ kg}$

$\checkmark E_{p1} + E_{k1} = E_{p2} + E_{k2}$

$$-\frac{GMm}{r_1} + \frac{1}{2}mv_1^2 = -\frac{GMm}{2r_1} + \frac{1}{2}mv_2^2 \quad (\Rightarrow v_2 = 0)$$

$$\frac{1}{2}v_1^2 = -\frac{GM}{2r_1} + \frac{GM}{2r_1} = 0$$

$$v_1 = \sqrt{\frac{GM}{r}} = \sqrt{\frac{6,67 \cdot 10^{-11} \cdot 5,97 \cdot 10^{24}}{6,38 \cdot 10^6}} = 7900,23 \text{ m/s}$$

b. Kecepatan lepas

$E_{p1} + E_{k1} = E_{p2} + E_{k2}$

$-\frac{GMm}{R} + \frac{1}{2}mv_1^2 = 0$

$\frac{1}{2}v_1^2 = \frac{GM}{R}$

$$v_1 = \sqrt{2GM/R} = \sqrt{2 \cdot 6,67 \cdot 10^{-11} \cdot 5,97 \cdot 10^{24} / 6,38 \cdot 10^6} = 11172,61 \text{ m/s}$$