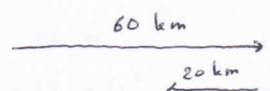
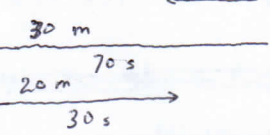


Kls. X

BDR 9

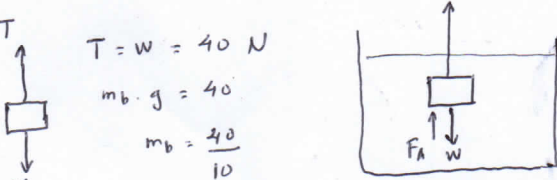
1. 

a. jarak = $60 + 20 = 80$ km
 b. perpindahan = $60 - 20 = 40$ km
2. 

kec. rata? $\Rightarrow \bar{v} = \frac{\Delta x}{\Delta t} = \frac{-30 + 20}{100} = -\frac{10}{100} = -0,1$ m/s
 laju rata? $\Rightarrow \bar{v} = \frac{\Delta x}{\Delta t} = \frac{30 + 20}{100} = \frac{50}{100} = 0,5$ m/s
3. $v_0 = 20$ m/s $v_t = 40$ m/s $v_t = v_0 + at \Rightarrow 40 = 20 + a \cdot 10 \Rightarrow 20 = 10 \cdot a \Rightarrow a = \frac{20}{10} = 2$ m/s²
 t = 10 s Dit. a
4. $s_1 = 540$ km } $v = \frac{s_1}{t_1} = \frac{540}{4,5} = \frac{600}{5} = 120$ km/jam
 $t_1 = 4,5$ jam
 a. $t_2 = 8$ jam $\Rightarrow v = \frac{s_2}{t_2} \Rightarrow s_2 = v \cdot t_2 = 120 \cdot 8 = 960$ km
 b. $s_3 = 200$ km $\Rightarrow v = \frac{s_3}{t_3} \Rightarrow t_3 = \frac{s_3}{v} = \frac{200}{120} = 1,67$ jam atau $\frac{5}{3}$ jam
5. $v_0 = 10$ m/s $v_t = 20$ m/s $v_t = v_0 + at \Rightarrow 20 = 10 + 2 \cdot t \Rightarrow 10 = 2t \Rightarrow t = \frac{10}{2} = 5$ s
 a = 2 m/s² Dit. t
6. $v_0 = 20$ m/s t = 10 s $\rightarrow v_t = v_0 + at = 20 + 1 \cdot 10 = 30$ m/s
 a = 1 m/s² t = 50 s $\rightarrow v_t = v_0 + at = 20 + 1 \cdot 50 = 70$ m/s
 Dit. v_t
7. $v_0 = 30$ m/s s = 1500 m $v^2 = v_0^2 + 2as \Rightarrow 0 = 30^2 + 2 \cdot a \cdot 1500 \Rightarrow -900 = 3000a \Rightarrow a = -\frac{900}{3000} = -\frac{3}{10} = -0,3$ m/s²
 t = 75 s Dit. v_t
 $v_t = v_0 + at = 30 + (-\frac{3}{10} \cdot 75) = 30 - 22,5 = 7,5$ m/s

Kls. XI

BDR 9

- a. $P_h = \rho g h = 1000 \cdot 10 \cdot 4 = 40000$ Pa
 b. $P = P_0 + P_h = 1,013 \times 10^5 \text{ Pa} + 0,4 \times 10^5 = 1,413 \times 10^5$ Pa
- $\frac{F_1}{A_1} = \frac{F_2}{A_2} \Rightarrow \frac{F_1}{\frac{1}{4}\pi D_1^2} = \frac{F_2}{\frac{1}{4}\pi D_2^2} \Rightarrow \frac{F_1}{D_1^2} = \frac{F_2}{D_2^2} \Rightarrow \frac{F_1}{2^2} = \frac{10000}{100^2} \Rightarrow F_1 = 4$ N
- $\frac{F_1}{A_1} = \frac{F_2}{A_2} \Rightarrow \frac{400}{10^2} = \frac{F_2}{20^2} \Rightarrow F_2 = 8000$ N
- 

a. $T + F_A = W \Rightarrow F_A = W - T = 40 - 32 = 8$ N
 b. $\rho_b = \frac{m_b}{V_b} = \frac{4}{8 \times 10^{-4}} = 0,5 \times 10^4 = 5000$ kg/m³
 $F_A = \rho_c \cdot V_b \cdot g$
 $8 = 1000 \cdot V_b \cdot 10$
 $V_b = \frac{8}{10000} = 8 \times 10^{-4}$ m³
5. Karena adanya gaya ke atas F_A

Kls X

BDR 10

8. $h = 20 \text{ m}$ $h = \frac{1}{2} g t^2 \Rightarrow 20 = \frac{1}{2} \cdot 10 \cdot t^2 \Rightarrow 4 = t^2 \Rightarrow t = \sqrt{4} = 2 \text{ s}$
 $g = 10 \text{ m/s}^2$ $v_t = g t \Rightarrow v_t = 10 \cdot 2 = 20 \text{ m/s}$

9. ~~$v_t = v_0 - g t = 6 - 10 \cdot t$~~ $v_t^2 = v_0^2 - 2 g h = 6^2 - 2 \cdot 10 \cdot (-12) = 36 + 240 = 276$

~~$h = v_0 t - \frac{1}{2} g t^2 \Rightarrow -12 = 6t - \frac{1}{2} \cdot 10 t^2 \Rightarrow -12 = 6t - 5t^2 \Rightarrow 5t^2 - 6t - 12 = 0$~~ $v_t = \sqrt{276} = 16,6 \text{ m/s}$
 ~~$(5t - 6)(t + 2) = 0$~~

Car 2:

$v_t = v_0 - g t \Rightarrow 0 = 6 - 10t \Rightarrow 10t = 6 \Rightarrow t = 0,6 \text{ s}$

~~$v_t = v_0 - g t = 0 = 6 - 10 \cdot 0,6 = 6 \text{ m/s}$~~ $h = v_0 t - \frac{1}{2} g t^2 = 6 \cdot 0,6 - \frac{1}{2} \cdot 10 \cdot 0,6^2 = 3,6 - 1,8 = 1,8 \text{ m}$
tinggi total $\Rightarrow h = 1,8 + 12 = 13,8 \text{ m}$

~~$v_t = \frac{1}{2} g t$~~ $v_t^2 = v_0^2 + 2 g h = 0 + 2 \cdot 10 \cdot 13,8 = 276 \Rightarrow v_t = \sqrt{276} = 16,6 \text{ m/s}$

10. $v_t^2 = v_0^2 + 2 \cdot g \cdot h = 6^2 + 2 \cdot 10 \cdot 8 = 36 + 160 = 196 \Rightarrow v_t = \sqrt{196} = 14 \text{ m/s}$

11. a. $t = 3 \text{ s} \rightarrow a = \frac{v_t - v_0}{t} = \frac{20 - 20}{5} = 0$

$t = 7 \text{ s} \rightarrow a = \frac{v_t - v_0}{t} = \frac{45 - 20}{4} = \frac{25}{4} = 6,25 \text{ m/s}^2$

$t = 11 \text{ s} \rightarrow a = \frac{v_t - v_0}{t} = \frac{13 - 45}{4} = \frac{-32}{4} = -8 \text{ m/s}^2$

b. $t = 5 \text{ s} \rightarrow s = v \cdot t = 20 \cdot 5 = 100 \text{ m}$

$t = 9 \text{ s} \rightarrow s = s_0 + v_0 t + \frac{1}{2} a t^2 = 100 + 20 \cdot 4 + \frac{1}{2} \cdot (6,25) \cdot 4^2 = 100 + 80 + 50 = 230 \text{ m}$

$t = 13 \text{ s} \rightarrow s = s_0 + v_0 t + \frac{1}{2} a t^2 = 230 + 45 \cdot 4 + \frac{1}{2} \cdot (-8) \cdot 4^2 = 230 + 180 - 64 = 346 \text{ m}$

12. a. $h = \frac{1}{2} g t^2 \Rightarrow 20 = \frac{1}{2} \cdot 10 \cdot t^2 \Rightarrow t^2 = 4 \Rightarrow t = \sqrt{4} = 2 \text{ s}$

b. $h = \frac{1}{2} g t^2 = \frac{1}{2} \cdot 10 \cdot 1^2 = 5 \text{ m}$

c. $h = \frac{1}{2} g t^2 \Rightarrow 5 = \frac{1}{2} \cdot 10 \cdot t^2 \Rightarrow t^2 = 1 \Rightarrow t = \sqrt{1} = 1 \text{ s} \Rightarrow v_t = g t = 10 \cdot 1 = 10 \text{ m/s}$

13. a. $v_t^2 = v_0^2 - 2 g h \Rightarrow 0 = v_0^2 - 2 \cdot 10 \cdot 10 \Rightarrow 0 = v_0^2 - 200 \Rightarrow v_0 = \sqrt{200} = 10\sqrt{2} \text{ m/s}$

b. $v_t = v_0 - g t \Rightarrow 0 = 10\sqrt{2} - 10 t \Rightarrow t = \sqrt{2} \text{ s}$

c. $h = v_0 t - \frac{1}{2} g t^2 = 10\sqrt{2} \cdot 2 - \frac{1}{2} \cdot 10 \cdot 2^2 = 20\sqrt{2} - 20 = 28,28 - 20 = 8,28 \text{ m}$

Kls. XI

BDR 10

$$6. \text{ banis 1} \rightarrow P = \frac{F}{A} = \frac{100}{2} = 50 \text{ Pa} \quad \left| \text{ banis 3} \rightarrow F = P \cdot A = 50000 \cdot 0,25 = 12500 \text{ N} \right.$$

$$\text{ banis 2} \rightarrow A = \frac{F}{P} = \frac{5}{5} = 1 \text{ m}^2 \quad \left| \text{ banis 4} \rightarrow A = \frac{F}{P} = \frac{10000}{2500} = 4 \text{ m}^2 \right.$$

7. dianulir tidak ada gambar \rightarrow tapi nilai untuk $P_m \cdot h_m = P_r \cdot h_r$

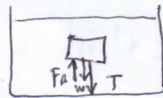
$$8. m_b = \frac{W}{g} = \frac{0,48}{10} = 0,048 \text{ kg} \quad T + F_A - W = 0 \Rightarrow F_A = W - T = 0,48 - 0,36 = 0,12 \text{ N}$$

$$V_b = \frac{F_A}{\rho_{\text{ca}} \cdot g} = \frac{0,12}{1000 \cdot 10} = 0,12 \times 10^{-4} \text{ m}^3 \Rightarrow \rho_b = \frac{m_b}{V_b} = \frac{0,048}{0,000012} = \frac{48000}{12} = 4000 \text{ kg/m}^3$$

$$9. \rho_{\text{ca}} = 1,2 \times 10^3 \text{ kg/m}^3$$

$$V_b = 5 \times 10^{-3} \text{ m}^3$$

$$\rho_b = 9 \times 10^2 \text{ kg/m}^3$$



$$F_A = T + W$$

$$T = F_A - W = 60 - 45 = 15 \text{ N}$$

$$F_A = \rho_{\text{ca}} \cdot V_b \cdot g = (1,2 \times 10^3) \cdot (5 \times 10^{-3}) \cdot 10 = 60 \text{ N}$$

$$W = m_b \cdot g = (\rho_b \cdot V_b) \cdot g = (9 \times 10^2) \cdot (5 \times 10^{-3}) \cdot 10 = 45 \text{ N}$$

$$10. \rho_b = 6500 \text{ kg/m}^3$$

$$D = 2 \times 10^{-2} \text{ m}$$

$$\rho_{\text{ca}} = 5100 \text{ kg/m}^3$$

$$\eta = 1,4 \text{ Pa}\cdot\text{s}$$

$$g = 10 \text{ m/s}^2$$

$$v_T = \frac{2r^2 g (\rho_b - \rho_{\text{ca}})}{9 \eta} = \frac{2 \cdot (10^{-2})^2 \cdot 10 \cdot (6500 - 5100)}{9 \cdot 1,4}$$

$$= \frac{20 \cdot 10^{-4} \cdot 1400}{9 \cdot 1,4} = \frac{20}{9} \cdot 10^{-4} \cdot 1000 = \frac{2}{9} \text{ m/s}$$

$$= 0,22 \text{ m/s}$$

Kls. XII

BDR 9

$$1. B = \frac{\mu_0 \cdot I}{2\pi a} = \frac{4\pi \cdot 10^{-7} \cdot 10}{2\pi \cdot 4 \times 10^{-2}} = 5 \times 10^{-5} \text{ T}$$

$$2. a. B = \frac{\mu_0 \cdot I}{2a} = \frac{4\pi \cdot 10^{-7} \cdot 2}{2 \cdot 10^{-1}} = 4\pi \times 10^{-6} \text{ T}$$

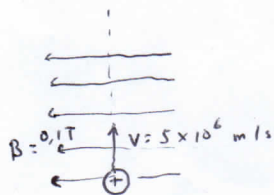
$$b. B = \frac{\mu_0 \cdot I}{2a} \text{ N} = (4\pi \times 10^{-6}) \cdot 50 = 200\pi \times 10^{-6} = 2\pi \times 10^{-4} \text{ T}$$

$$3. B = \mu_0 \cdot n \cdot I = \mu_0 \cdot \frac{N}{L} \cdot I = 4\pi \cdot 10^{-7} \cdot \frac{750}{0,25} \cdot 2 = 8\pi \cdot 10^{-7} \cdot 3000 = 24000\pi \times 10^{-7} = 2,4\pi \times 10^{-3} \text{ T}$$

$$4. F = qvB \sin \theta = (1,6 \times 10^{-19}) \cdot (5 \times 10^6) \cdot (0,1) \cdot \sin 90^\circ$$

$$= 0,8 \times 10^{-13} \times 1$$

$$= 8 \times 10^{-14} \text{ N}$$



arah keluar (menuju pengamat) \odot

$$5. \frac{F}{L} = B \cdot I \cdot \sin \theta = (5 \times 10^{-5}) \cdot 5 \cdot \sin 30^\circ$$

$$= 25 \times 10^{-5} \times \frac{1}{2}$$

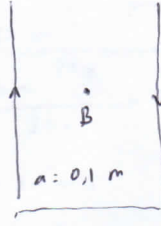
$$= 12,5 \times 10^{-5}$$

$$= 1,25 \times 10^{-4} \text{ N/m}$$

Kls XII

BDR 10

6. $I_1 = 5A$ $I_2 = 10A$


$$B = B_1 + B_2 = \frac{\mu_0 I_1}{2\pi a} + \frac{\mu_0 I_2}{2\pi a} = \frac{\mu_0}{2\pi a} (I_1 + I_2) = \frac{4\pi \times 10^{-7}}{2\pi \times 0.1} (5 + 10)$$
$$= \frac{4\pi \times 10^{-7}}{2\pi \times 0.1} \times 15 = \frac{4 \times 10^{-7} \times 15}{2 \times 0.1} = \frac{60 \times 10^{-7}}{0.2} = 30 \times 10^{-5} = 6 \times 10^{-5} T$$

B_1 & B_2 arah masuk jadi dijumlahkan.

7. $B = \frac{\mu_0 I N}{2a} \Rightarrow 4\pi \times 10^{-3} = \frac{4\pi \times 10^{-7} \times I \times 20}{2 \times 10^{-1}} \Rightarrow I = \frac{I \cdot 10^{-3}}{10^{-1}} \Rightarrow I = \frac{10^{-1}}{10^{-3}} = 100 A$

8. $B = \mu_0 n \cdot I = \mu_0 \frac{N}{L} \cdot I = 4\pi \times 10^{-7} \cdot \frac{450}{0.6} \cdot 5 = 20\pi \cdot 10^{-7} \cdot 750 = 15000\pi \cdot 10^{-7} = 1.5\pi \times 10^{-3} T$

9. $F = B \cdot I \cdot L \sin \theta = (0.2) \cdot 45 \cdot (0.1) \cdot \sin 90^\circ = (0.9) \cdot 1 = 0.9 N$

10. $\frac{F}{L} = \frac{\mu_0 I_1 I_2}{2\pi a} \Rightarrow 12 \times 10^{-7} = \frac{4\pi \times 10^{-7} \cdot I_1^2}{2\pi \times 1.5} \Rightarrow 9 = I_1^2 \Rightarrow I_1 = \sqrt{9} = 3 A$