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Kelas : 23 A

Matkul : Fisika Modern

1.) Diketahui : $V = 106 \text{ km/jam} = 29,44 \text{ m/s}$

$$t = 0 \text{ s}$$

$$t' = 30 \text{ s}$$

$$x' = 1 \text{ km} = 1000 \text{ m}$$

Ditanya : a) (x', t') ... ?

b) (x'', t'') ... ?

Jawab :

a) $(x', t') = (1000 \text{ m}, 30 \text{ s})$

$$t'' = t' = 30 \text{ s.}$$

b) $x'' = x' - Vt$

$$= 1000 - (29,44)(30)$$

$$= 1000 - 883,2$$

$$= 116,8 \text{ m}$$

$$(x'', t'') = (116,8 \text{ m}, 30 \text{ s})$$

2.) Diketahui : $V_b : 15 \text{ m/s}$ (berlawanan arah)

$$V_k : 72 \text{ km/jam} = 20 \text{ m/s}$$

Ditanya : V_{bs} ... ?

Jawab : $V_{bs} = V_k - V_b$

$$= 20 - 15$$

$$= 5 \text{ m/s.}$$

3. Diketahui : $V_A = 60 \text{ km/jam}$

$$V_B = 40 \text{ km/jam}$$

Ditanya : a) V_{AB} ... ?

b) V_{BA} ... ?

Jawab :

a) $V_{AB} = V_A - V_B$

$$= 60 - 40$$

$$= 20 \text{ km/jam (searah)}$$

b) $V_{BA} = V_B - V_A$

$$= 40 - 60$$

$$= -20 \text{ km/jam (berlawanan arah)}$$



4.) Diketahui : $x' = 5 \text{ m}$

$$v = 36 \text{ km/jam} = 10 \text{ m/s}$$

$$t' = 5 \text{ s}$$

Ditanya : a) (x', t') ... ?

b) (x, t) ... ?

Jawab :

a) $(x', t') = (5, 5)$

b) $x = (v \cdot t') + x'$ $= (10 \cdot 5) + 5$ $= 55 \text{ m}$	$t = t' = 5 \text{ s}$
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5.) Diketahui : $L = 100 \text{ m}$

$$v = 60 \text{ m/s}$$

$$c = 80 \text{ m/s}$$

Ditanya : a) t tegak lurus ... ?

b) t sudut 53° terhadap arus ... ?

Jawab :

a) $t = \frac{L}{v_y}$
 $= \frac{100}{80}$

$$t = 1,25 \text{ s.}$$

b) $v_y = c = 80 \text{ m/s}$

$$x = v_A \cdot t$$
$$= 60 \text{ m/s} \cdot 1,25 \text{ s}$$
$$= 75 \text{ m}$$

$$v_y = c \sin 53^\circ$$
$$= 80 \times 0,8 = 64 \text{ m/s}$$

$$t = \frac{L}{v_y}$$

$$= \frac{100}{64}$$

$$t = 1,56 \text{ s.}$$

6.) Diketahui : $C = C$

$$u = u$$

$$L = 2L \text{ (bolak-balik)}$$

Ditanya : a) t total arus ... ?

b) perbandingan t total arus dengan t total tegak lurus ... ?

Jawab :

a) $V_{\text{berlawanan}} = C - u$

$$t_{\text{pergi}} = \frac{L}{C - u}$$

$$V_{\text{searah}} = C + u$$

$$t_{\text{kembali}} = \frac{L}{C + u}$$

$$t_{\text{total arus}} = \frac{L}{C - u} + \frac{L}{C + u}$$

$$= \frac{L(C + u) + L(C - u)}{(C - u)(C + u)} = \frac{LC + Lu + LC - Lu}{C^2 - u^2} = \frac{2LC}{C^2 - u^2}$$

b.) $C^2 = V^2 + u^2$

$$V = C^2 - u^2$$

$$V = \sqrt{C^2 - u^2}$$

$$t_{\text{seberang}} = \frac{L}{\sqrt{C^2 - u^2}}$$

$$t_{\text{total tegak lurus}} = 2 \times \frac{L}{\sqrt{C^2 - u^2}}$$

$$\frac{\text{Total Arus}}{\text{Total Tegak lurus}} = \frac{\frac{2LC}{C^2 - u^2}}{2 \times \frac{L}{\sqrt{C^2 - u^2}}}$$

$$= \frac{C}{C^2 - u^2} \times \sqrt{C^2 - u^2}$$

$$= \frac{C \sqrt{C^2 - u^2}}{C^2 - u^2}$$

$$= \frac{C}{\sqrt{C^2 - u^2}}$$

Total arus (berlawanan + searah) $>$ Total tegak lurus (bolak-balik)

