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Mata kuliah : Fisika Modern

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

   $t = 0s$

   $t' = 30s$

   $x' = 1$ km $= 1000$ m

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

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

   Jawab   : a). $(x', t') = (1000$ m, $30s)$

   b). $x'' = x' - vt$

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

   $= 1000 - 883,2$

   $= 116,8$ m

   $t'' = t' = 30s$

   $(x'', t'') = (116,8$ m, $30s)$

2). Diketahui : $V_b = 15$ m/s (berlawanan arah)

   $V_k = 72$ km/jam $= 20$ m/s

   Ditanya : V_{bs}?

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

   $= 20 - 15$

   $= 5$ m/s

3). Diketahui : $V_A = 60$ km/jam

   $V_B = 40$ km/jam

   Ditanya : a. V_{AB}?

   b. V_{BA} ?

   Jawab   : a. $V_{AB} = V_A - V_B$

   $= 60 - 40$

   $= 20$ km/jam (searah)

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

   $= 40 - 60$

   $= -20$ km/jam (berlawanan)

4). Diketahui : $x' = 5m$

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

$t' = 5s$

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

b. (x, t) ...?

Jawab : a). $(x', t') = (5,5)$

b). $x = (v \cdot t') + x'$

$= (10.5) + 5$

$= 55 M$

$t = t' = 5s$

$(x, t) = (55, 5)$

5). Diketahui : $d = 100m$

$V_A = 60 m/s$

$V_P = 80 m/s$

Ditanya : a. x ...?

b. t' ...?

Jawab : a). $t = \frac{d}{V_P}$ $x = V_A \cdot t$

$= \frac{100 M}{80 m/s}$ $= 60 \cdot 1,25$

$= 75 M$

$= 1,25 s$

b). $V_y = V_P \sin \theta$ $t' = \frac{d}{V_y}$

$= 80 \sin 53°$ $= \frac{100m}{63,84 m/s}$

$= 80 \cdot 0,798$

$= 63,84 m/s$ $= 1,57 s$

6). Diketahui : $C = C$

$U = U$

$L = 2L$ (bolak-balik)

D.tanya : a). $t_{TOTAL ARUS}$?

b). Perbandingan t TOTAL ARUS dengan t TOTAL TEGAK LURUS?

Jawab : a). V berlawanan $= C - U$

$t_{pergi} = \frac{L}{C-U}$

V searah $= C + U$

$t_{kembali} = \frac{L}{C+U}$

$t_{total\ Arus} = \frac{L}{C-U} + \frac{L}{C+U}$

$= \frac{L(C+U) + L(C-U)}{(C-U)(C+U)} = \frac{LC + LU + LC - LU}{C^2 - U^2} = \frac{2LC}{C^2 - U^2}$

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

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

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

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

$t_{TOTAL\ TEGAK\ LURUS} = 2 \times \dfrac{L}{\sqrt{C^2 - u^2}}$

$$\dfrac{T_{Total\ Arus}}{T_{TOTAL\ TEGAK\ LURUS}} = \dfrac{\dfrac{2Lc}{C^2 - u^2}}{2 \times \dfrac{L}{\sqrt{C^2 - u^2}}}$$

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

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

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

$T_{TOTAL\ ARUS}$ (berlawanan + searah) $> T_{TOTAL\ TEGAK\ LURUS}$ (bolak-balik)