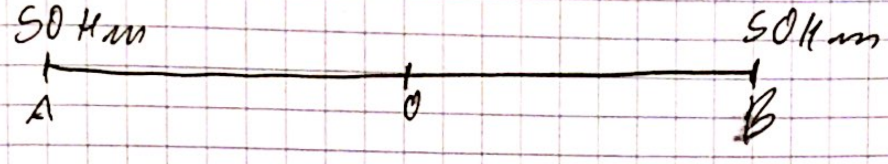
P1)



a) ubicar evento usando Δt_{sp}: $V_p = 6 \text{ Km/s}$

• $(T_S - T_P)_A = 9,95 \text{ s}$

• $(T_S - T_P)_B = 8,12 \text{ s}$

• Razon poisson:

$V_p = \sqrt{3}\, V_S$

$V_S \approx 3,5 \text{ Km/s}$

$\Rightarrow v = \dfrac{d}{t} \Rightarrow t = \dfrac{d}{v}$

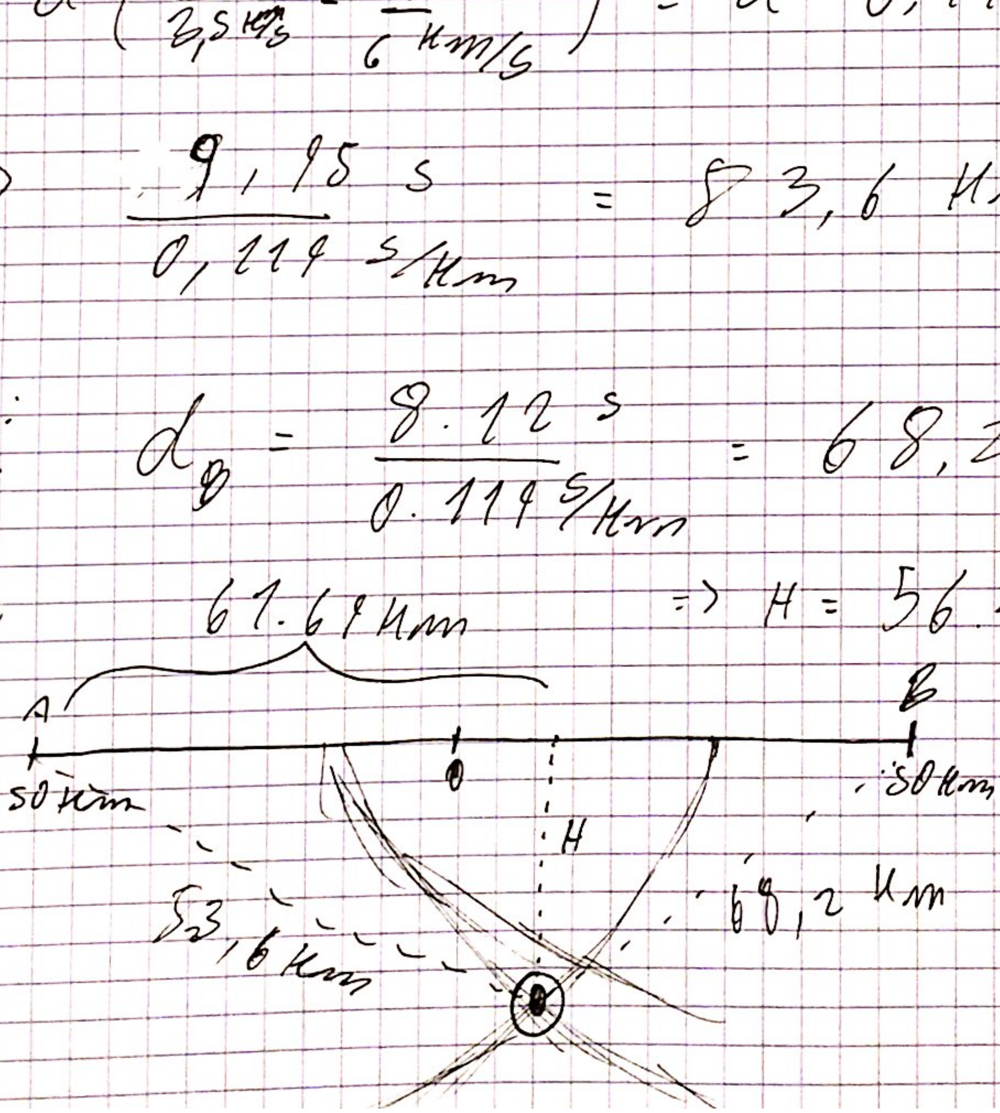
A: $(T_S - T_P) = \left(\dfrac{d}{v_S} - \dfrac{d}{v_P}\right)$

$= d\left(\dfrac{1}{3,5 \text{ Km/s}} - \dfrac{1}{6 \text{ Km/s}}\right) = d \cdot 0,119 \text{ s/Km}$

$\Rightarrow \dfrac{9,95 \text{ s}}{0,119 \text{ s/Km}} = 83,6 \text{ Km} = d_A$

B: $d_B = \dfrac{8.12 \text{ s}}{0.119 \text{ s/Km}} = 68,2 \text{ Km}$

pitagoras $\Rightarrow H = 56.42 \text{ Km}$



b) Calcular T_p y T_S para A y B:

$$v = \frac{d}{t} \Rightarrow t = \frac{d}{v}$$

A:

- $T_p = \frac{83,6 \text{ Km}}{6 \text{ Km/s}} = 13.9 \text{ s}$

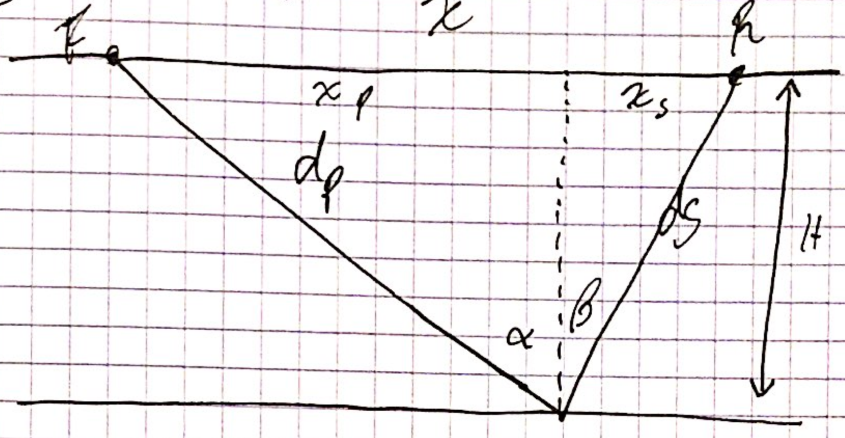
- $T_S = \frac{83,6 \text{ Km}}{3,5 \text{ Km/s}} = 23.9 \text{ s}$

B:

- $T_p = \frac{68,2 \text{ Km}}{6 \text{ Km/s}} = 11.4 \text{ s}$

- $T_S = \frac{68,2 \text{ Km}}{3,5 \text{ Km/s}} = 19.5 \text{ s}$

Pr) $v_s < v_p$



$$T_R = \frac{d_p}{v_p} + \frac{d_s}{v_s}$$

$$d_p = \sqrt{(x-x_p)^2 + H^2} \qquad d_s = \sqrt{(x-x_s)^2 + H^2}$$

$$T_R = \frac{\sqrt{(x-x_p)^2 + H^2}}{v_p} + \frac{\sqrt{(x-x_s)^2 + H^2}}{v_s}$$

* princípio de Fermat: trajectoria que segue uma onda sobre um medio é aquella que minimiza T.

$$\Rightarrow \frac{dT}{dx} = 0$$

$$\Rightarrow \frac{dT_R}{dx} = \frac{1}{2}\frac{2(x-x_p)}{\sqrt{(x-x_p)^2+H^2}\, v_p} + \frac{1}{2}\frac{2(x-x_s)}{\sqrt{(x-x_s)^2+H^2}\, v_s} = 0$$

$$\Rightarrow v_p \frac{x-x_p}{d_p} = \frac{x-x_s}{v_s \; d_s}$$

$$\Rightarrow \frac{\operatorname{sen}\alpha}{v_p} = \frac{\operatorname{sen}\beta}{v_s}$$

Si $x >> H \Rightarrow \alpha \to \frac{\pi}{2}$ y $\beta \Rightarrow \frac{\pi}{2}$

$\Rightarrow v_p = v_s$