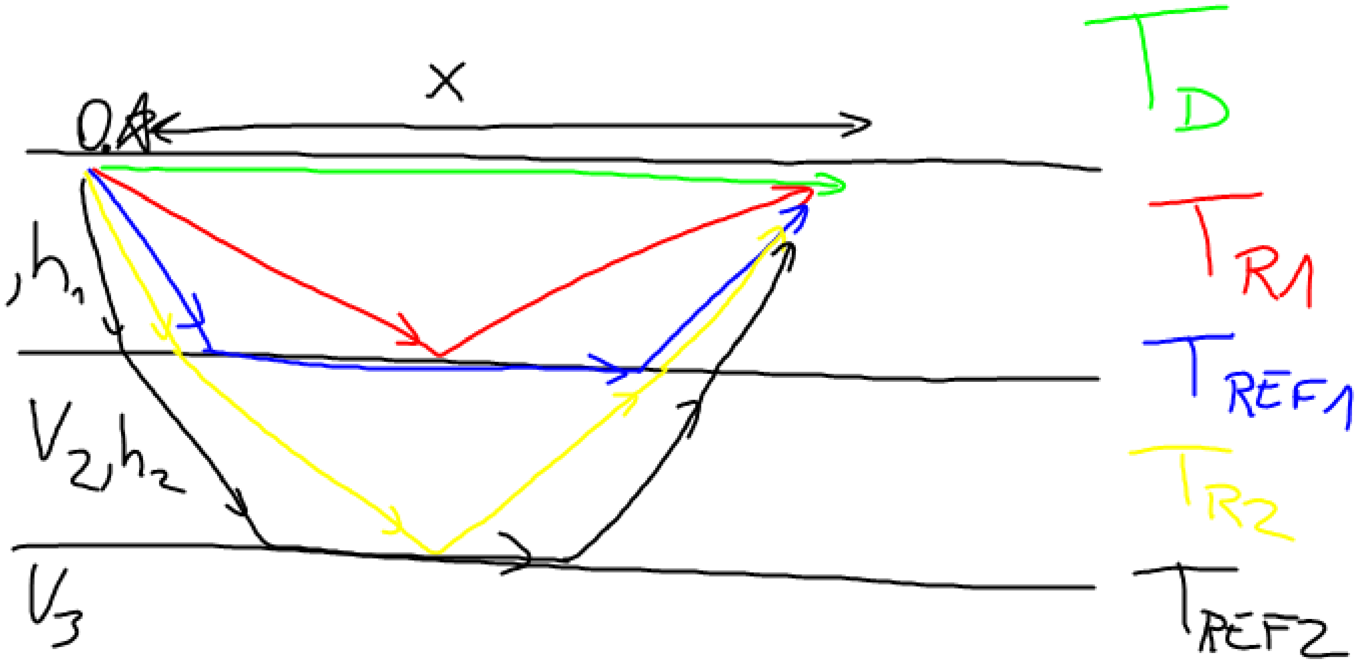
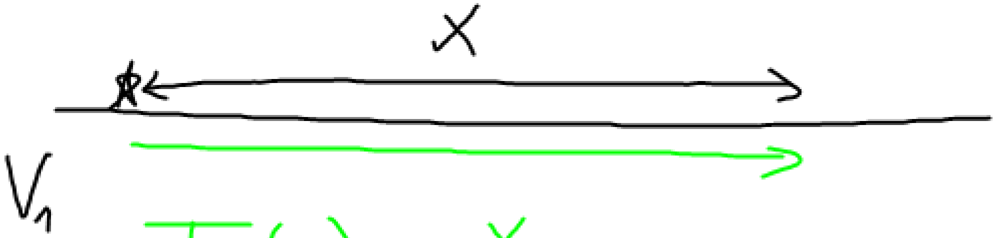
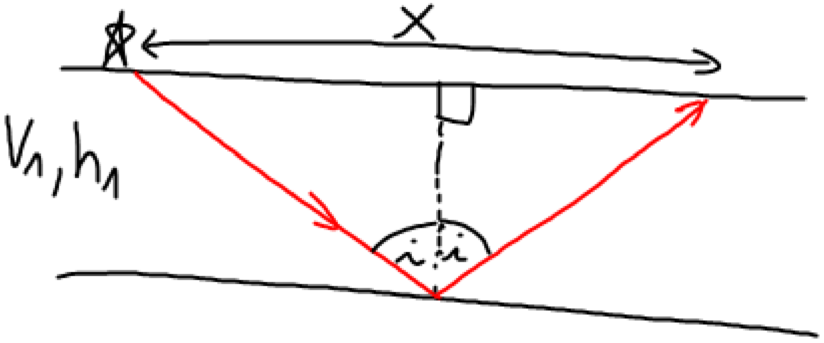
AUX SISMICA

1)



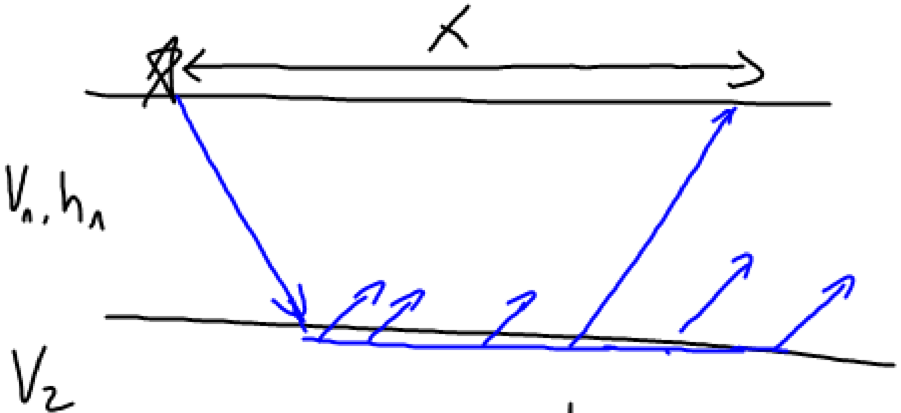


$$T_D(x) = \frac{x}{V_1}$$



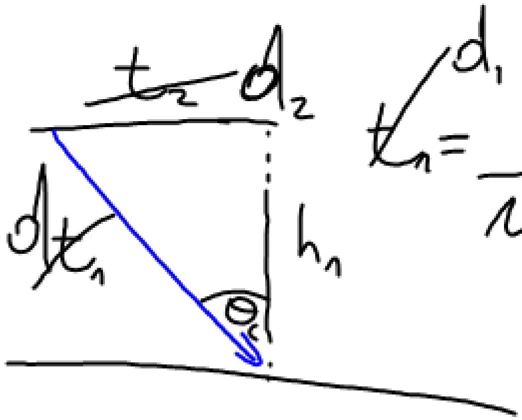
$$T_{R_1}(x) = \frac{2\cdot\sqrt{h_1^2 + \left(\frac{x}{2}\right)^2}}{V_1}$$

$$T_{R_1}^2 = \frac{4h_1^2}{V_1^2} + \frac{x^2}{V_1^2}$$



$$\frac{\operatorname{sen}\theta_c}{V_1} = \frac{\operatorname{sen}\frac{\pi}{2}}{V_2}$$

$$\operatorname{sen}\theta_c = \frac{V_1}{V_2}$$



$$\overset{d_1}{t_1} = \frac{h_1}{\cos\theta_c} = \frac{h_1}{\sqrt{1-\left(\frac{V_1}{V_2}\right)^2}} = h_1 \cdot \frac{V_2}{\sqrt{V_2^2 - V_1^2}}$$

$$d_2 = h_1 \cdot \operatorname{tg}\theta_c = \frac{V_1}{V_2} \cdot \frac{V_2}{\sqrt{V_2^2 - V_1^2}} \longrightarrow \operatorname{tg}\theta_c = \frac{V_1}{\sqrt{V_2^2 - V_1^2}}$$

$$T_{REF1}(X) = 2h_1 \cdot \frac{V_2}{\sqrt{V_2^2 - V_1^2}} \cdot \frac{1}{V_1} + \frac{(X - 2h_1 \cdot \operatorname{tg}\theta_c)}{V_2}$$

$$T_{REF1}(X) = \frac{X}{V_2} + 2h_1 \left[\frac{V_2}{V_1} \cdot \frac{1}{\sqrt{V_2^2 - V_1^2}} - \frac{V_1}{V_2} \cdot \frac{1}{\sqrt{V_2^2 - V_1^2}} \right]$$

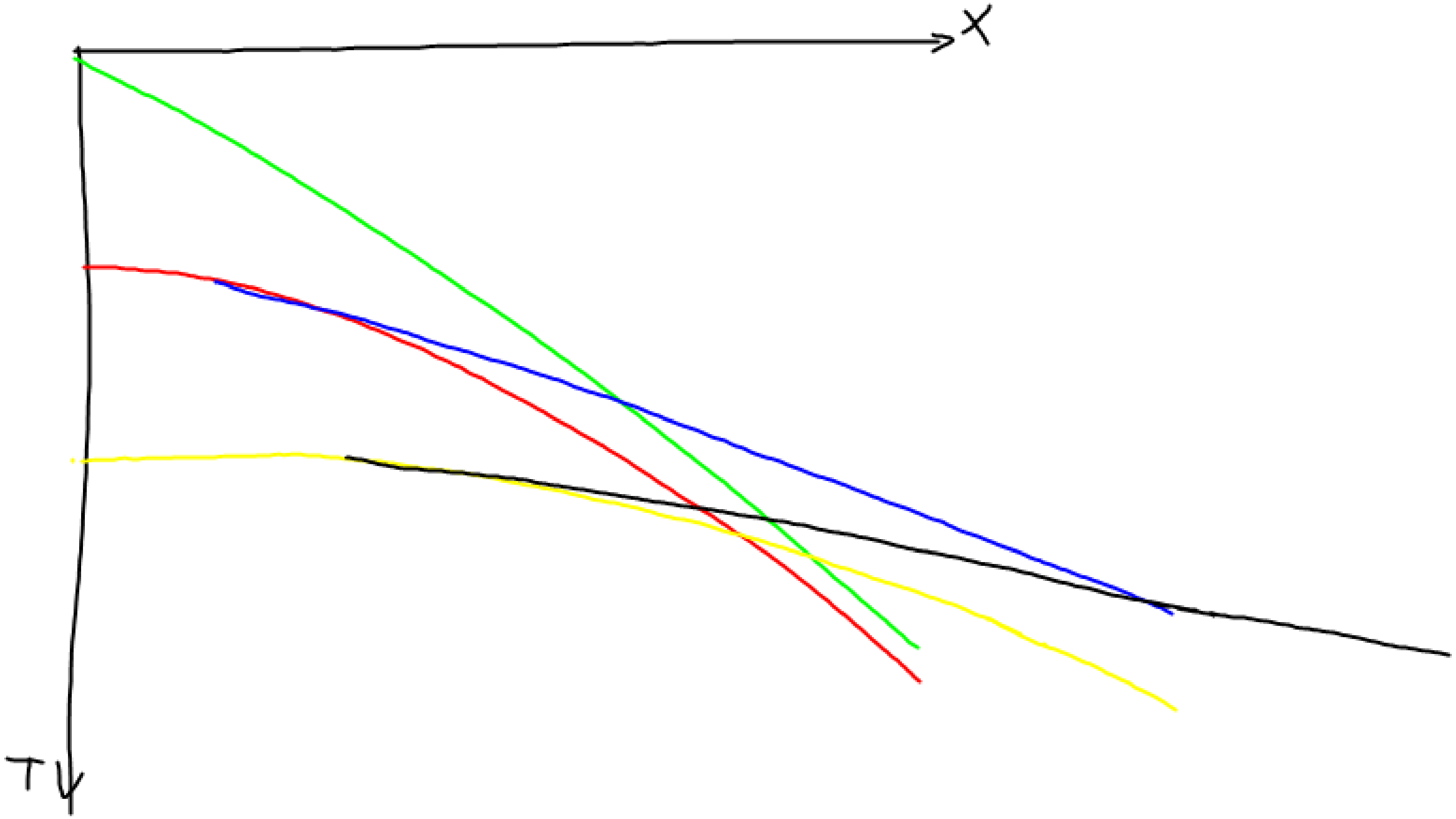
$$T_{REF1}(x) = \frac{X}{V_2} + \frac{2h_1}{\sqrt{V_2^2 - V_1^2}} \left[\frac{V_2}{V_1} - \frac{V_1}{V_2} \right]$$

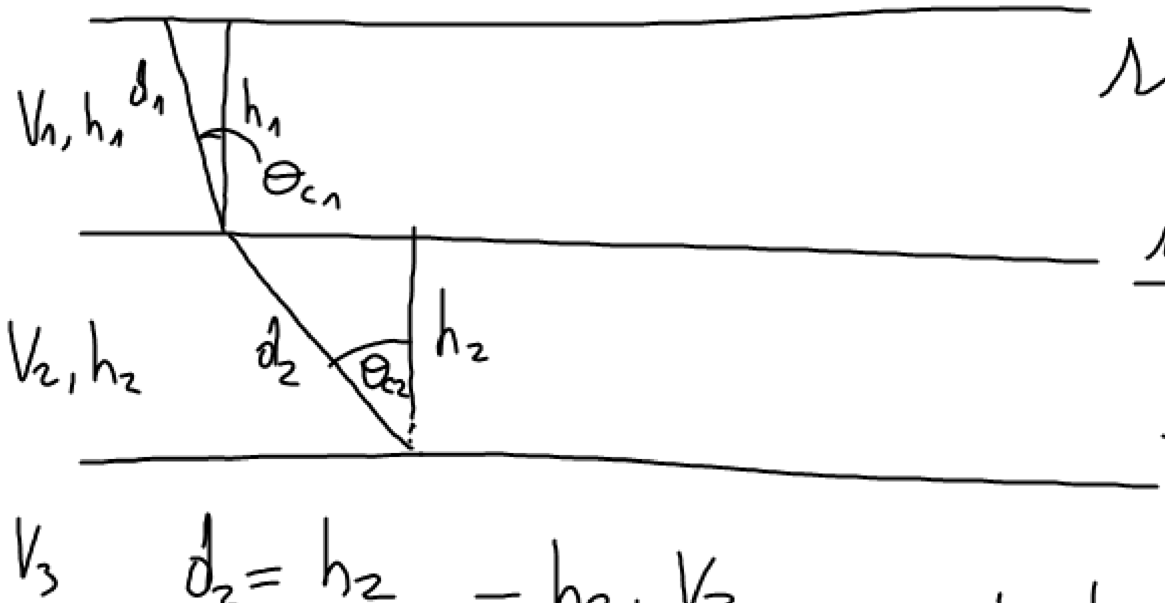
$$\frac{V_2^2 \cdot \cancel{V_1}}{V_1^{\cancel{2}} \cdot V_2} - \frac{V_1^2 \cdot \cancel{V_2}}{V_2^{\cancel{2}} \cdot V_1}$$

$$\frac{V_2^2 - V_1^2}{V_1 V_2}$$

$$T_{REF1}(x) = \frac{X}{V_2} + \frac{2h_1}{V_1 V_2} \cdot \frac{\left(\sqrt{V_2^2 - V_1^2}\right)^{\cancel{2}}}{\cancel{\sqrt{V_2^2 - V_1^2}}}$$

$$T_{REF1}(x) = \frac{X}{V_2} + 2h_1 \cdot \sqrt{\frac{1}{V_1^2} - \frac{1}{V_2^2}}$$


X
T



$$\operatorname{sen}\theta_{c2} = \frac{V_2}{V_3}$$

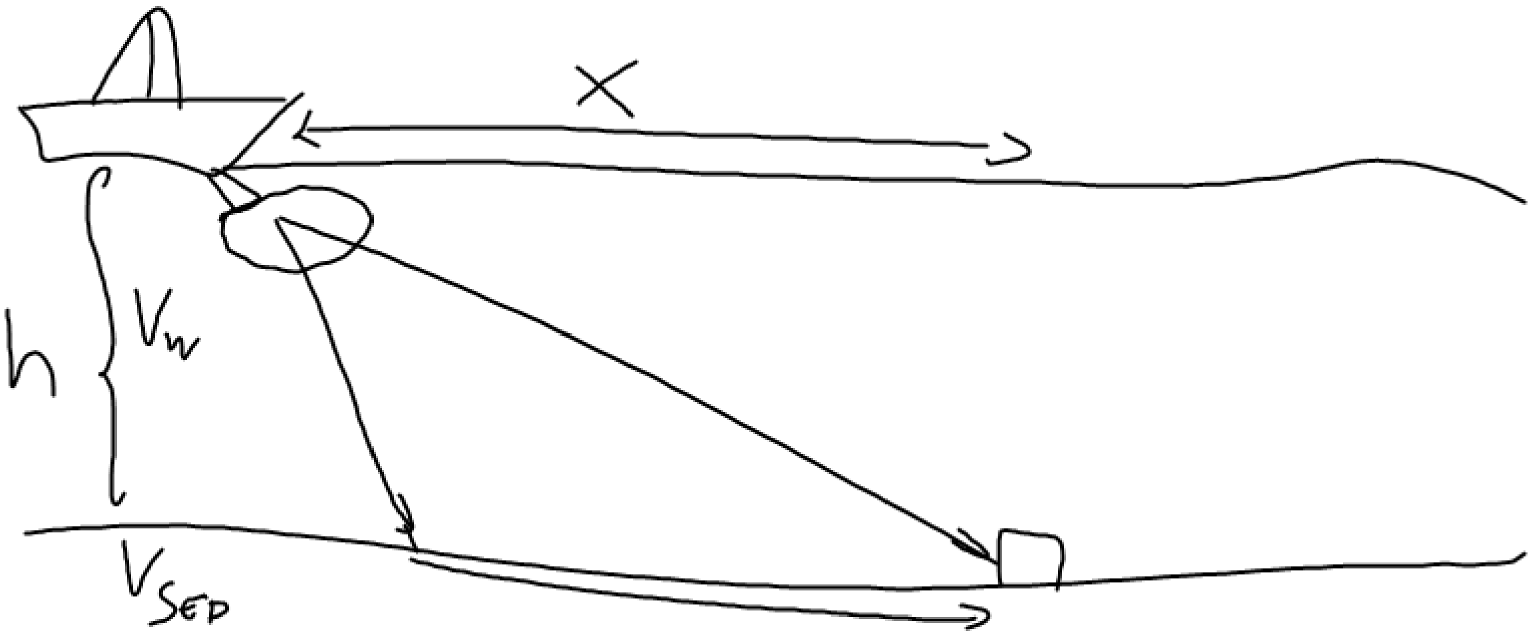
$$\frac{\operatorname{sen}\theta_{c1}}{V_1} = \frac{\operatorname{sen}\theta_{c2}}{V_2}$$

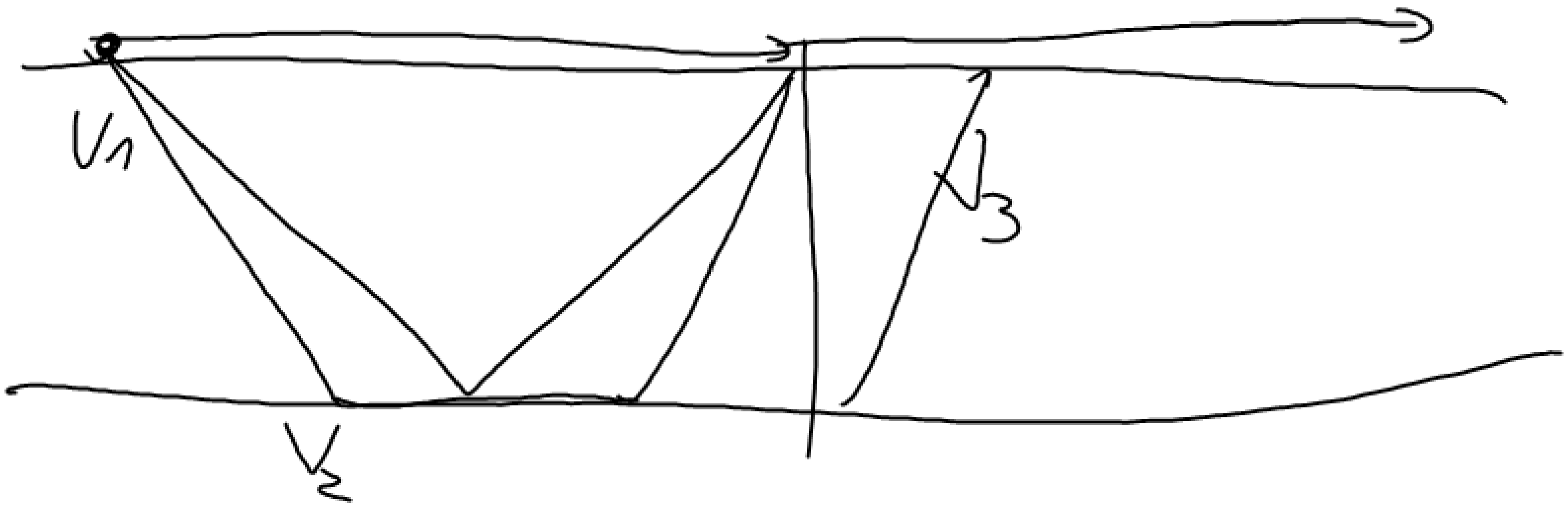
$$\operatorname{sen}\theta_{c1} = \frac{V_1}{V_3}$$

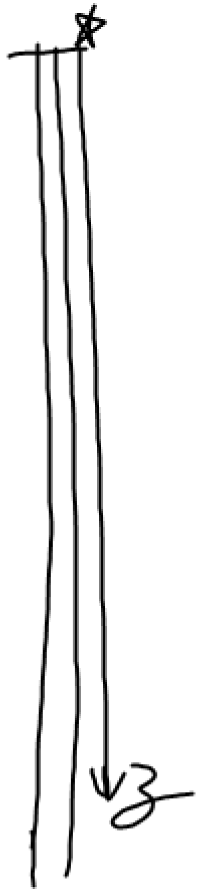
$$d_2 = \frac{h_2}{\cos\theta_{c2}} = \frac{h_2 \cdot V_2}{\sqrt{V_3^2 - V_2^2}}$$

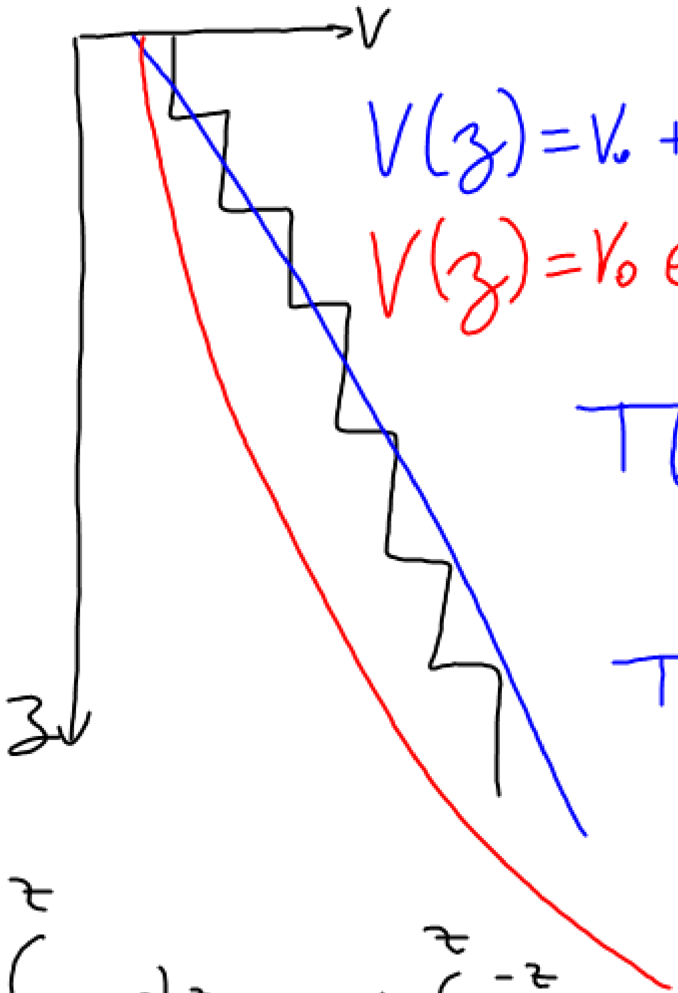
$$d_1 = \frac{h_1}{\cos\theta_{c1}} = \frac{h_1 \cdot V_1 \cdot}{\sqrt{V_3^2 - V_1^2}}$$

PROP.


X
h
Vw
VSED


V1
V2
V3





$$V(z) = V_0 + k \cdot z$$

$$V(z) = V_0 \exp(z)$$

$$T = \frac{d}{v}$$

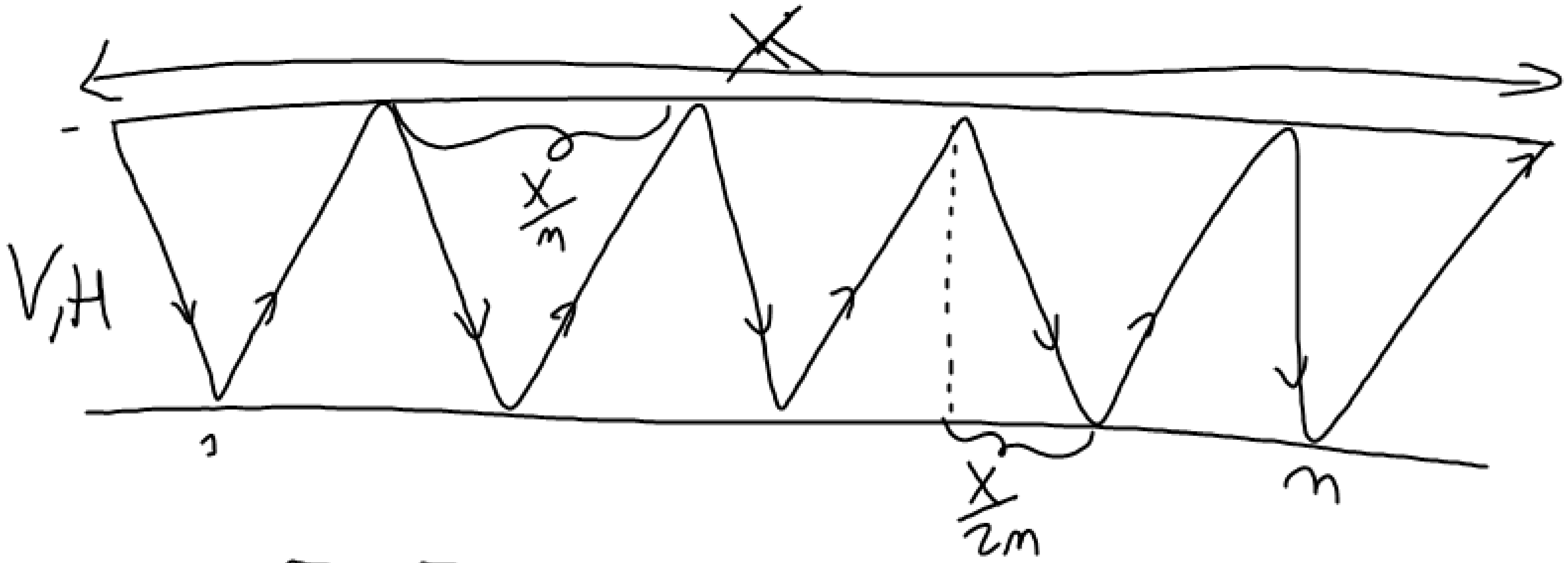
$$T(z) = \int_0^z \frac{dz}{V_0 + k \cdot z}$$

$$T(z) = \left. \frac{\log(V_0 + kz)}{k} \right|_0^z$$

$$T(z) = \frac{1}{k} \cdot \log\left(\frac{V_0 + k \cdot z}{V_0}\right)$$

$$T(z) = \int_0^z \frac{dz}{V_0 e^{z}} = \frac{1}{V_0} \int_0^z e^{-z} \, dz = -\frac{1}{V_0} \left. e^{-z} \right|_0^z = -\frac{1}{V_0} \left[e^{-z} - 1 \right] = \frac{1}{V_0} \left(1 - e^{-z} \right)$$

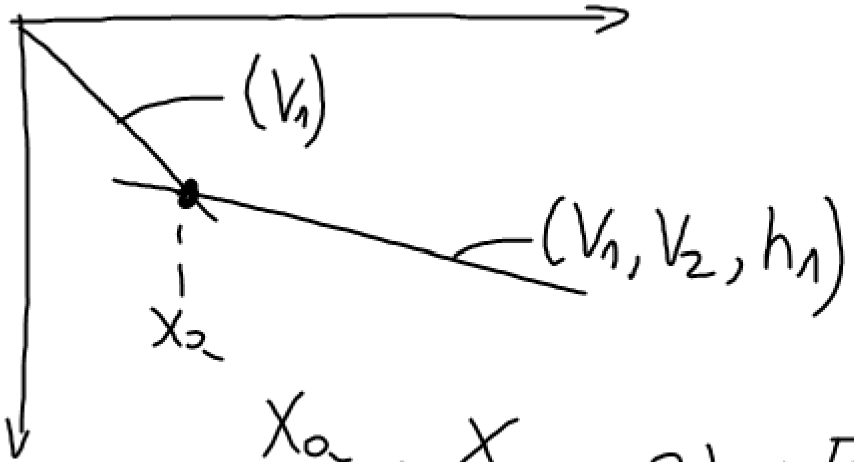
$$T(z) = \frac{1}{V_0} \left(1 - e^{-z} \right)$$



$$T_{n\,\text{ultimo}} = \frac{\sqrt{\frac{X}{4n^2}+H^2}\cdot 2}{V} = \frac{\sqrt{(X/n)^2+4H^2}}{V}$$

$$T_n(x) = \frac{\sqrt{X^2+4H^2n^2}}{V}$$

$$T_n^2 = \frac{X^2}{V^2} + \frac{4H^2n^2}{V^2} \rightarrow t_{0n}^2$$



$$\frac{X_a}{V_1} = \frac{X_a}{V_2} + 2h_1\cdot\sqrt{\frac{1}{V_1^2}-\frac{1}{V_2^2}}$$

$$X_a\left(\frac{1}{V_1}-\frac{1}{V_2}\right) = 2h_1\cdot\sqrt{\frac{1}{V_1^2}-\frac{1}{V_2^2}}$$

$$X_a = 2h_1\cdot\sqrt{\frac{1}{V_1^2}-\frac{1}{V_2^2}}\cdot\left(\frac{V_1V_2}{V_2-V_1}\right)$$

$$X_a = 2h_1\cdot\frac{\cancel{V_1V_2}}{V_2-V_1}\cdot\sqrt{\frac{V_2^2-V_1^2}{\cancel{V_1^2V_2^2}}}$$

$$X_a = 2h_1\sqrt{\frac{(V_2-V_1)(V_2+V_1)}{(V_2-V_1)^2}}$$

$$X_a = 2h_1\cdot\sqrt{\frac{V_2+V_1}{V_2-V_1}}$$

$$h_1 = \frac{X_a}{2}\cdot\sqrt{\frac{V_2-V_1}{V_2+V_1}}$$