

A serene landscape with misty mountains and a calm lake. The scene is bathed in a soft, teal light, creating a dreamy atmosphere. The mountains are layered, with the closest ones showing more detail and the further ones fading into the mist. The lake in the foreground is still, reflecting the surrounding landscape and the light. The overall color palette is dominated by various shades of teal and light blue.

TALASI

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1. Rastojanje između brega i najbliže dolje talasa je 9 m. Ako je čestici, koja osciluje i prenosi talas, potrebno 0,25 s da dođe od jednog do drugog amplitudnog položaja, izračunati period, frekvenciju, talasnu dužinu i brzinu tog talasa.

$$\frac{\lambda}{2} = 9m \quad \longrightarrow \quad \lambda = 2 \cdot 9m = 18m$$

$$\frac{T}{2} = 0,25s \quad \longrightarrow \quad T = 2 \cdot 0,25s = 0,5s$$

$$v = \frac{1}{T} = \frac{1}{0,5s} = 2Hz$$

$$T = ?$$

$$v = ?$$

$$\lambda = ?$$

$$v = ?$$

$$v = \frac{\lambda}{T} = \frac{18m}{0,5s} = 36 \frac{m}{s}$$

2. Talas prelazi iz jedne u drugu sredinu i pri tome se talasna dužina poveća. Kolika će biti brzina talasa u drugoj sredini, ako je u prvoj 8 m/s i ako je odnos talasnih dužina u tim sredinama 1,3.

$$v_1 = 8 \frac{m}{s}$$

$$v_2 = ?$$

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

$$\lambda = v \cdot T$$

$$\lambda_1 = v_1 \cdot T$$

$$\lambda_2 = v_2 \cdot T$$

$$\frac{\lambda_2}{\lambda_1} = 1,3$$

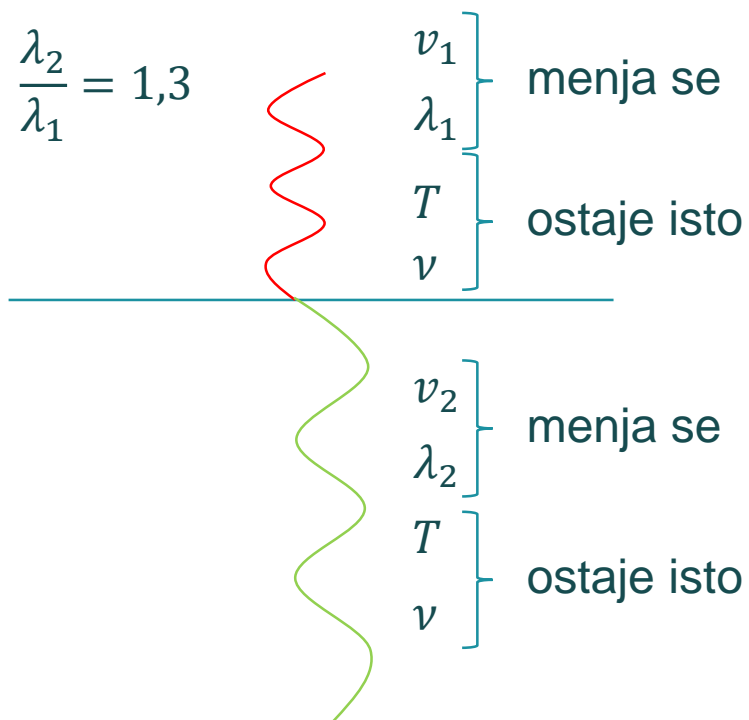
$$\frac{v_2 \cdot T}{v_1 \cdot T} = 1,3$$

$$\frac{v_2}{v_1} = 1,3$$

$$v_2 = 1,3 \cdot v_1$$

$$v_2 = 1,3 \cdot 8 \frac{m}{s}$$

$$v_2 = 10,4 \frac{m}{s}$$



3. Planinar je ispustio kamen u provaliju duboku 45 m. Posle koliko vremena čuje udar kamena u dno provalije? Brzina zvuka u vazduhu je 340 m/s.

$$S = 45m$$

$$v_z = 340 \frac{m}{s}$$

$$t = ?$$

$$S = \frac{g \cdot t_1^2}{2}$$

$$t_1^2 = \frac{2 \cdot S}{g}$$

$$t_1^2 = \frac{2 \cdot 45m}{10 \frac{m}{s^2}}$$

$$t_1^2 = 9s^2$$

$$t_1 = \sqrt{9s^2}$$

$$t_1 = 3s$$

$$t_2 = \frac{S}{v_z}$$

$$t_2 = \frac{45m}{340 \frac{m}{s}}$$

$$t_2 = 0,13s$$

$$v = v_0 \pm g \cdot t$$

$$S = v_0 \cdot t \pm \frac{g \cdot t^2}{2}$$

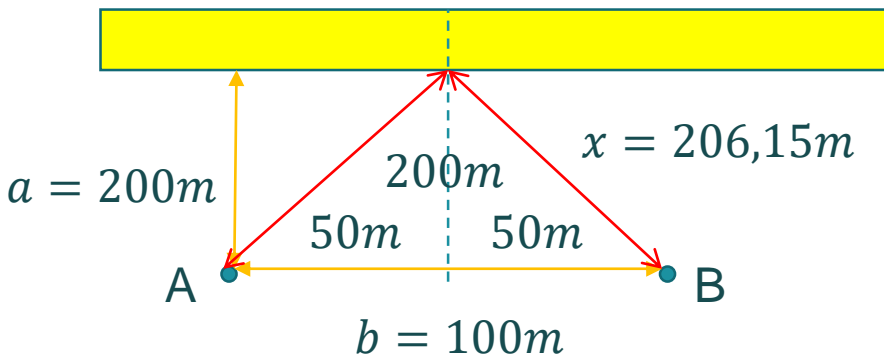
$$v^2 = v_0^2 \pm 2 \cdot g \cdot S$$

$$t = t_1 + t_2$$

$$t = 3s + 0,13s$$

$$t = 3,13s$$

4. Čovek u tački A ispali hitac (uvis). Čovek u tački B čuje dva pucnja u razmaku 0,92s. Obojica se nalaze ispred vertikalne stene na rastojanju 200 m. Udaljenost između ljudi je 100 m. Kolika je brzina zvuka?



$$a = 200m$$

$$b = 100m$$

$$\Delta t = 0,92s$$

$$x^2 = (200m)^2 + (50m)^2$$

$$x^2 = 40\,000\,m^2 + 2\,500\,m^2$$

$$x^2 = 42\,500\,m^2$$

$$x = \sqrt{42\,500\,m^2}$$

$$x = 206,15m$$

$$\Delta t = t_2 - t_1$$

$$\Delta t = \frac{S_2}{v} - \frac{S_1}{v}$$

$$\Delta t = \frac{2 \cdot x}{v} - \frac{b}{v}$$

$$0,92s = \frac{2 \cdot 206,15m}{v} - \frac{100m}{v}$$

$$0,92s = \frac{412,3m}{v} - \frac{100m}{v}$$

$$0,92s = \frac{312,3m}{v}$$

$$v = \frac{312,3m}{0,92s}$$

$$v = 339,5 \frac{m}{s}$$

5. Razlika talasnih dužina dvaju talasa istog tipa nastalih u istoj sredini iznosi 4 m, dok frekvencije istih stoje u odnosu 2:3. Kolike su njihove talasne dužine?

$$\Delta\lambda = \lambda_1 - \lambda_2 = 4m$$

$$\frac{\nu_1}{\nu_2} = \frac{2}{3}$$

$$\lambda_1 = ?$$

$$\lambda_2 = ?$$

$$\frac{\nu_1}{\nu_2} = \frac{2}{3}$$

$$\frac{\frac{v}{\lambda_1}}{\frac{v}{\lambda_2}} = \frac{2}{3}$$

$$\frac{\lambda_2 \cdot v}{\lambda_1 \cdot v} = \frac{2}{3}$$

$$\frac{\lambda_2}{\lambda_1} = \frac{2}{3}$$

$$\lambda_2 = \frac{2\lambda_1}{3} \longrightarrow \lambda_2 = \frac{2 \cdot 12m}{3} = 8m$$

$$\Delta\lambda = \lambda_1 - \lambda_2$$

$$4m = \lambda_1 - \frac{2\lambda_1}{3}$$

$$4m = \frac{3\lambda_1}{3} - \frac{2\lambda_1}{3}$$

$$4m = \frac{\lambda_1}{3}$$

$$\lambda_1 = 3 \cdot 4m$$

$$\lambda_1 = 12m$$