2ad 37.5

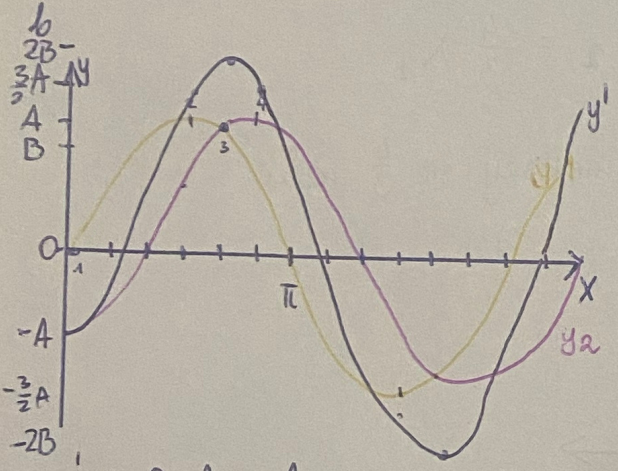
rys I

a) $2\pi - 12$, $x - 1$ $\quad x = \frac{2\pi}{12} = \frac{1}{6}\pi$

$\Delta\varphi = 2x$

$\Delta\varphi = 2 \cdot \frac{1}{6}\pi = \frac{\pi}{3}$

b



$y_1' = -0 - A = -A$

$y_2' = A + \frac{A}{2} = \frac{3}{2}A$

$y_3' = B + B = 2B$

$y_4' = \frac{A}{2} + A = \frac{3}{2}A$

c) $y_1(x,t) = A\sin\left[\omega\left(t - \frac{x_1}{v}\right)\right]$

$y_2(x,t) = A\sin\left[\omega\left(t - \frac{x_2}{v}\right)\right]$

$y = y_1 + y_2 = A'\sin\left[\omega\left(t - \frac{x_1'}{v}\right)\right]$

$y = A\left(\sin\left[\omega\left(t - \frac{x_1}{v}\right)\right] + \sin\left[\omega\left(t - \frac{x_2}{v}\right)\right]\right)$

$\sin\alpha + \sin\beta = 2\cos\left(\frac{\alpha-\beta}{2}\right)\sin\left(\frac{\alpha+\beta}{2}\right)$

$y = 2A\cos\left(\frac{\omega\left(t - \frac{x_1}{v}\right) - \omega\left(t - \frac{x_2}{v}\right)}{2}\right)\sin\left(\frac{\omega\left(t - \frac{x_1}{v}\right) + \omega\left(t - \frac{x_2}{v}\right)}{2}\right)$

$A' = 2A\cos\left[\frac{\omega\left(t - \frac{x_1}{v}\right) - \omega\left(t - \frac{x_2}{v}\right)}{2}\right]$

$A' = 2A\cos\left[\frac{\omega}{2}\left(\frac{x_2}{v} - \frac{x_1}{v}\right)\right]$

$A' = 2A\cos\left[\frac{\omega}{2v}(x_2 - x_1)\right] \quad \frac{\omega}{v} = 1$

$A' = 2A\cos\left[\frac{1}{2}(x_2 - x_1)\right]$

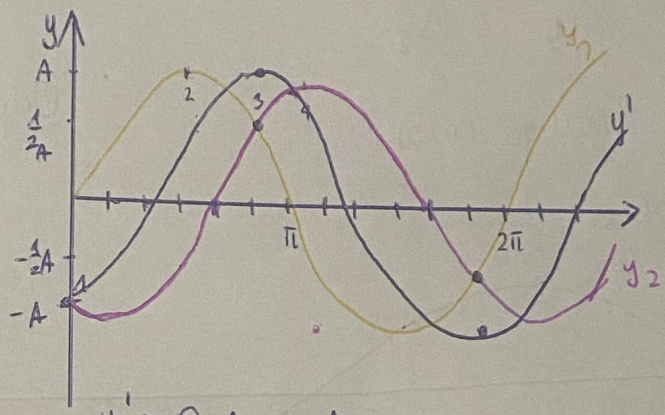
rys II

a) $x = \frac{2\pi}{12} = \frac{1}{6}\pi$

$\Delta\varphi = 4x$

$\Delta\varphi_2 = 4 \cdot \frac{1}{6}\pi = \frac{2}{3}\pi$

b



$y_1' = 0 - A = -A$

$y_2' = A - \frac{1}{2}A = \frac{1}{2}A$

$y_3' = \frac{1}{2}A + \frac{1}{2}A = A$

$y_4' = -\frac{1}{2}A + A = \frac{1}{2}A$

c) rys I

$x_1 = \frac{3}{6}\pi$

$x_2 = \frac{5}{6}\pi$

$A' = 2A\cos\left[\frac{1}{2}\left(\frac{5}{6}\pi - \frac{3}{6}\pi\right)\right]$

$A' = 2A\cos\left[\frac{\pi}{6}\right]$

$A' = \sqrt{3}A$

b) rys II

$x_1 = \pi$

$x_2 = \frac{10}{6}\pi$

$A' = 2A\cos\left[\frac{1}{2}\left(\frac{10}{6}\pi - \pi\right)\right]$

$A' = 2A\cos\left(\frac{1}{3}\pi\right)$

$A' = A$