Oblig 6

Oskar Idland

Oppgave 1

a)

$$T = \int \mathrm{d}t$$

$$\mathrm{d}t = \frac{\mathrm{d}s}{v(x, y(x))}$$

$$\mathrm{d}s = \sqrt{\mathrm{d}x^2 + \mathrm{d}y^2} = \sqrt{1 + (x'y)^2}\mathrm{d}y$$

$$\mathrm{d}t = \frac{\sqrt{1 + (x'y)^2}}{v(x, y(x))}\mathrm{d}y$$

We know the speed of light to be:

$$c(y) = \frac{c_0}{\sqrt{1 - y^2}}$$

and so we insert that instead of $v(x, y(x))$:

$$\underline{\underline{T = \int \frac{\sqrt{1 - ky}}{c_0}\sqrt{1 + (x'y)^2}\mathrm{d}y}}$$