

Oppervlakte van een trapezium

$$12. \quad A_V = \cos t \cdot \sin t + \frac{1}{2} \cdot \sin t \cdot (1 - \cos t) = \frac{1}{2} \sin 2t + \frac{1}{2} \sin t - \frac{1}{4} \sin 2t = \\ = \frac{1}{2} \sin t + \frac{1}{4} \sin 2t$$

$$13. \quad \frac{dV}{dt} = \frac{1}{2} \cos t + \frac{1}{2} \cos 2t$$

$$\frac{dV}{dt} = 0 \quad \rightarrow \quad \cos t = -\cos 2t$$

Met de GR:

$$y_1 = \cos x \qquad y_2 = -\cos 2x$$

$$\text{intersect} \quad \rightarrow \quad x = \frac{\pi}{3}$$

Dus voor $t = \frac{\pi}{3}$ is V maximaal.

$$14. \quad \int_0^{\frac{\pi}{2}} \left(\frac{1}{2} \sin t + \frac{1}{4} \sin 2t \right) dt = \frac{\pi}{2} \cdot k$$

$$\frac{1}{4} \int_0^{\frac{\pi}{2}} (2 \sin t + \sin 2t) dt = \frac{1}{4} \cdot \left[-2 \cos t - \frac{1}{2} \cos 2t \right]_0^{\frac{\pi}{2}} = \frac{1}{4} \cdot \left(\frac{1}{2} - (-2 - \frac{1}{2}) \right) = \frac{3}{4}$$

$$\rightarrow \quad \frac{\pi}{2} \cdot k = \frac{3}{4} \qquad \text{dus} \quad k = \frac{3}{2\pi}$$