

De wijzers van een uurwerk

8. Er geldt dan $\cos(2\pi t) = \cos\left(\frac{1}{6}\pi t\right)$
en $\sin(2\pi t) = \sin\left(\frac{1}{6}\pi t\right)$

$$\cos(2\pi t) = \cos\left(\frac{1}{6}\pi t\right) \rightarrow 2\pi t = \frac{1}{6}\pi t + 2k\pi \rightarrow 1\frac{5}{6} = \frac{2k}{t} \rightarrow t = \frac{12}{11}k$$

$$\sin(2\pi t) = \sin\left(\frac{1}{6}\pi t\right) \rightarrow t = \frac{12}{11}k$$

Op $t = \frac{12}{11}$ liggen de wijzers over elkaar heen.

9.
$$S = \sqrt{(3\sin(2\pi) - 2\sin\left(\frac{1}{6}\pi\right))^2 + (3\cos(2\pi) - 2\cos\left(\frac{1}{6}\pi\right))^2} =$$
$$= \sqrt{9\sin^2(2\pi) - 12\sin(2\pi)\sin\left(\frac{1}{6}\pi\right) + 4\sin^2\left(\frac{1}{6}\pi\right) + 9\cos^2(2\pi) - 12\cos(2\pi)\cos\left(\frac{1}{6}\pi\right) + 4\cos^2\left(\frac{1}{6}\pi\right)} =$$
$$= \sqrt{13 - 12\sin(2\pi)\sin\left(\frac{1}{6}\pi\right) - 12\cos(2\pi)\cos\left(\frac{1}{6}\pi\right)}$$
$$= \sqrt{13 - 12\cos\left(\frac{11}{6}\pi\right)}$$

10.
$$\sqrt{13 - 12\cos\left(\frac{11}{6}\pi\right)} = 2$$

$$\cos\left(\frac{11}{6}\pi\right) = \frac{9}{12} = \frac{3}{4} \rightarrow \frac{11}{6}\pi t = 0,723 + 2k\pi$$

Voor $k = 0$ geldt $t = \frac{0,723}{\pi} \cdot \frac{6}{11} = 0,125$

Of met de GR:

$$y_1 = \cos\left(\frac{11}{6} \cdot \pi \cdot x\right) \quad y_2 = \frac{3}{4}$$

Intersect: $\rightarrow x = 0,125 \rightarrow t = 0,125$