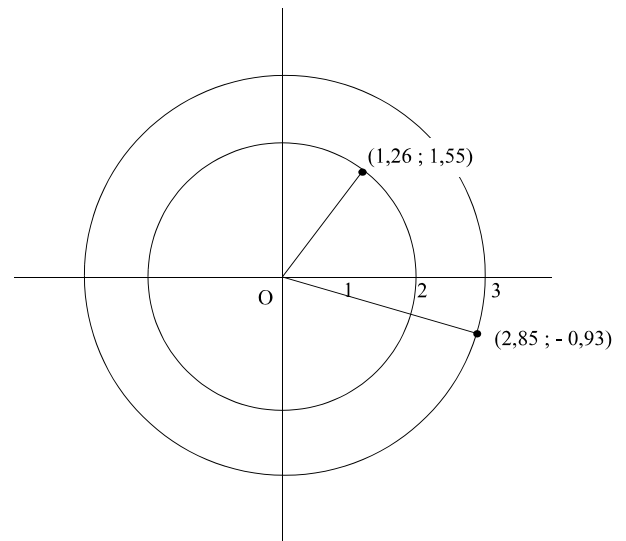


Eindexamen wiskunde B1 vwo 2004-II

© havovwo.nl

De wijzers van een uurwerk

13. grote wijzer: $x = 3 \sin(2\pi \cdot 1,3) = 2,85$
 $y = 3 \cos(2\pi \cdot 1,3) = -0,93$
 kleine wijzer: $x = 2 \sin(\frac{1}{6}\pi \cdot 1,3) = 1,26$
 $y = 2 \cos(\frac{1}{6}\pi \cdot 1,3) = 1,55$



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

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

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

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

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

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

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

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

Of met de GR:

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

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