

Eindexamen wiskunde B1 vwo 2005-II

© havovwo.nl

Twee benaderingen van $\sin x$

1. $O(0, 0)$ en $G(0) = 0$

$$T\left(\frac{1}{2}\pi, 1\right) \text{ en } g\left(\frac{1}{2}\pi\right) = \frac{-4}{a^2} \cdot \frac{1}{2}\pi \left(\frac{1}{2}\pi - \pi\right) = 1$$

$$A(\pi, 0) \text{ en } g(\pi) = 0$$

2.
$$g(x) = -\frac{4}{\pi^2}x^2 + \frac{4}{\pi}x \quad \rightarrow \quad g'(x) = \frac{8}{\pi^2}x + \frac{4}{\pi} \quad \rightarrow \quad g'(0) = \frac{4}{\pi}$$
$$f(x) = \sin x \quad \rightarrow \quad f'(x) = \cos x \quad \rightarrow \quad f'(0) = 1$$

$$\rightarrow \frac{4}{\pi} > 1 \quad \rightarrow \quad g'(0) > f'(0)$$

3.
$$\int_0^{\pi} ax^2 - a\pi x - \sin x \, dx = \left[\frac{1}{3}ax^3 - \frac{1}{2}a\pi x^2 + \cos x \right]_0^{\pi} = \frac{1}{3}a\pi^3 - \frac{1}{2}a\pi^3 - 1 - 1 = 0$$

$$\rightarrow a = -\frac{12}{\pi^3}$$