$g(x) = mx \qquad m > 0 \qquad \text{Schnittpunkt } Z(z \mid f(z))$

$$A_1 = \int_0^z (f(x) - g(x))\,dx$$

$$= \int_0^z \left(3\sin\left(\tfrac{\pi}{4}x\right) - mx\right)dx$$

$$= \left[-\tfrac{12}{\pi}\cos\left(\tfrac{\pi}{4}x\right) - \tfrac{m}{2}x^2\right]_0^z$$

$$= \left[-\tfrac{12}{\pi}\cos\left(\tfrac{\pi z}{4}\right) - \tfrac{mz^2}{2}\right] - \left[-\tfrac{12}{\pi}\cos(0)\right]$$

$$= -\tfrac{12}{\pi}\cos\left(\tfrac{\pi z}{4}\right) - \tfrac{mz^2}{2} + \tfrac{12}{\pi}$$

$$A_2 = \int_z^4 (g(x) - f(x))\,dx$$

$$= \int_z^4 \left(mx - 3\sin\left(\tfrac{\pi}{4}x\right)\right)dx$$

$$= \left[\tfrac{m}{2}x^2 + \tfrac{12}{\pi}\cos\left(\tfrac{\pi}{4}x\right)\right]_z^4$$

$$= \left[8m + \tfrac{12}{\pi}\cos(\pi)\right] - \left[\tfrac{mz^2}{2} + \tfrac{12}{\pi}\cos\left(\tfrac{\pi}{4}z\right)\right]$$

$$= 8m - \tfrac{12}{\pi} - \tfrac{mz^2}{2} - \tfrac{12}{\pi}\cos\left(\tfrac{\pi z}{4}\right)$$

$$A_1 = A_2$$

$$-\tfrac{12}{\pi}\cos\left(\tfrac{\pi z}{4}\right) - \tfrac{mz^2}{2} + \tfrac{12}{\pi} = 8m - \tfrac{12}{\pi} - \tfrac{mz^2}{2} - \tfrac{12}{\pi}\cos\left(\tfrac{\pi z}{4}\right)$$

$$-\tfrac{12}{\pi}\cos\left(\tfrac{\pi z}{4}\right) + \tfrac{12}{\pi} = 8m - \tfrac{12}{\pi} - \tfrac{12}{\pi}\cos\left(\tfrac{\pi z}{4}\right)$$

$$\tfrac{12}{\pi} = 8m - \tfrac{12}{\pi}$$

$$8m = \tfrac{24}{\pi}$$

$$m = 3/\pi$$

$$m \approx 0{,}95$$