

例1 $\int_{-\infty}^{\infty} 3 \cos \omega t \cdot \delta(t) dt$

$$= 3 \cos 0 = \boxed{3}$$

例2

$$\int_{-\infty}^{\infty} 2 \sin \pi t \cdot \delta(t-2) dt$$

$$= 2 \sin 2\pi = \boxed{0}$$

演習1

$$f(x) = \sin\left(\frac{\pi}{2}x\right) \text{ のとき、}$$

$$\int_{-\infty}^{\infty} f(x) \delta(x-2) dx$$

$$= \int_{-\infty}^{\infty} \sin\left(\frac{\pi}{2}x\right) \delta(x-2) dx$$

$$= \sin \frac{\pi}{2} \cdot 2 = \boxed{0}$$