

第7章の補遺2 三角関数の累乗の積分

問題 7.補遺2.1

$$\int_{\frac{\pi}{2}}^{2\pi} \cos^4 x dx = \frac{3}{4} \int_{\frac{\pi}{2}}^{2\pi} \cos^2 x dx = \frac{3}{4} \frac{1}{2} \int_{\frac{\pi}{2}}^{2\pi} dx = \frac{3}{4} \frac{1}{2} \left(2\pi - \frac{\pi}{2} \right) = \frac{9}{8} \pi .$$

問題 7.補遺2.2

$$\int_{\pi}^{2\pi} \sin^5 x dx = \frac{4}{5} \int_{\pi}^{2\pi} \sin^3 x dx = \frac{4}{5} \frac{2}{3} \int_{\pi}^{2\pi} \sin x dx = \frac{4}{5} \frac{2}{3} [-\cos x]_{\pi}^{2\pi} = \frac{4}{5} \frac{2}{3} \cdot (-2) = -\frac{16}{15} .$$