

Here are some integrals that may help with problems #22 and #23 in section 4.5.

$$\int_{-\pi}^{\pi} t^2 dt = \frac{2\pi^3}{3} \quad \int_{-\pi}^{\pi} t^2 \sin(t) dt = 0 \quad \int_{-\pi}^{\pi} t^2 \cos(t) dt = -4\pi$$

$$\int_{-\pi}^{\pi} t^2 \sin(2t) dt = 0 \quad \int_{-\pi}^{\pi} t^2 \cos(2t) dt = \pi \quad \int_{-\pi}^{\pi} e^t dt = e^{\pi} - e^{-\pi}$$

$$\int_{-\pi}^{\pi} e^t \sin(t) dt = \frac{1}{2}(e^{\pi} - e^{-\pi}) \quad \int_{-\pi}^{\pi} e^t \cos(t) dt = \frac{1}{2}(e^{-\pi} - e^{\pi})$$

$$\int_{-\pi}^{\pi} e^t \sin(2t) dt = \frac{2}{5}(e^{-\pi} - e^{\pi}) \quad \int_{-\pi}^{\pi} e^t \cos(2t) dt = \frac{1}{5}(e^{\pi} - e^{-\pi})$$