Some Useful Facts About Integrals of Special Functions To Remember

1. Suppose that f is an integrable odd function. Then for any real number $a \in \mathbb{R}$
$$\int_{-a}^{a} f(x)\, dx = 0.$$

2. Suppose that f is an integrable even function. Then for any real number $a \in \mathbb{R}$
$$\int_{-a}^{a} f(x)\, dx = 2 \int_{0}^{a} f(x)\, dx.$$

3. Suppose that $k \in \mathbb{R}$, $k \neq 0$. Then for any interval $[a, b]$ of length $\frac{2\pi n}{k}$ where $n \in \mathbb{N}_0$
$$\int_{a}^{b} \sin kx \; dx = 0$$
and
$$\int_{a}^{b} \cos kx \; dx = 0.$$

4. Let f be an integrable periodic function of period P. Then for any $a \in \mathbb{R}$ we have
$$\int_{a}^{a+P} f(x)\, dx = \int_{0}^{P} f(x)\, dx.$$

5. Let f be an integrable odd periodic function of period P. Then for any interval $[a, b]$ of length nP where $n \in \mathbb{N}_0$
$$\int_{a}^{b} f(x)\, dx = 0.$$