Samples **Integrals SOLUTIONS**

1.

$$\begin{aligned}
& \int_{-\pi/2}^{2\pi} \left(4\cos\left(2x\right) + 9\sin\left(3x\right)\right) dx \\
= & \left[2\sin\left(2x\right) - 3\cos\left(3x\right)\right]_{-\pi/2}^{2\pi} \\
= & \left(2\sin\left(2\left(2\pi\right)\right) - 3\cos\left(3\left(2\pi\right)\right)\right) - \left(2\sin\left(2\left(-\pi/2\right)\right) - 3\cos\left(3\left(-\pi/2\right)\right)\right) \\
= & \left(2\sin\left(4\pi\right) - 3\cos\left(6\pi\right)\right) - \left(2\sin\left(-\pi\right) - 3\cos\left(-3\pi/2\right)\right) \\
= & \left(2\left(0\right) - 3\left(1\right)\right) - \left(2\left(0\right) - 3\left(0\right)\right) \\
= & \left(-3\right) - \left(0\right) \\
= & -3
\end{aligned}$$

2.

$$\begin{aligned}
& \int_{3\pi}^{4\pi} \left(2\cos\left(2x\right)\right) dx \\
= & \left[\sin\left(2x\right)\right]_{3\pi}^{4\pi} \\
= & \left(\sin\left(2\left(4\pi\right)\right)\right) - \left(\sin\left(2\left(3\pi\right)\right)\right) \\
= & \left(\sin\left(8\pi\right)\right) - \left(\sin\left(6\pi\right)\right) \\
= & \left(\left(0\right)\right) - \left(\left(0\right)\right) \\
= & \left(0\right) - \left(0\right) \\
= & 0
\end{aligned}$$

3.

$$\begin{aligned}
& \int_{0}^{3\pi} \left(4\sin\left(4x\right)\right) dx \\
= & \left[-\cos\left(4x\right)\right]_{0}^{3\pi} \\
= & \left(-\cos\left(4\left(3\pi\right)\right)\right) - \left(-\cos\left(4\left(0\right)\right)\right) \\
= & \left(-\cos\left(12\pi\right)\right) - \left(-\cos\left(0\right)\right) \\
= & \left(-\left(1\right)\right) - \left(-\left(1\right)\right) \\
= & \left(-1\right) - \left(-1\right) \\
= & 0
\end{aligned}$$