<center>**Multiple Integration**

Iteration of Double Integrals</center>

Question

Calculate the given iterated integral.

$$\int_0^\pi \int_{-x}^x \cos y \, dy \, dx$$

Answer

$$
\begin{aligned}
& \int_0^\pi \int_{-x}^x \cos y \, dy \, dx \\
=\; & \int_0^\pi \sin y \big|_{y=-x}^{y=x} \, dx \\
=\; & 2 \int_0^\pi \sin x \, dx = -2 \cos x \big|_0^\pi \\
=\; & 4
\end{aligned}
$$