Answer on Question #51700 - Math - Integral Calculus

Question

What is the definite integral of this |sin x| . limit is from -pi/2 to +pi/2?

Solution

It is known that the antiderivative of $\sin(x)$ is $-\cos(x)+C$, where C is an arbitrary real constant. Next, apply Newton-Leibnitz formula, which gives

$$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin x\, dx = -\cos x \Big|_{-\frac{\pi}{2}}^{\frac{\pi}{2}} = -\cos\frac{\pi}{2} - \left(-\cos\left(-\frac{\pi}{2}\right)\right) = -\cos\frac{\pi}{2} + \cos\frac{\pi}{2} = 0,$$

$\cos\left(-\frac{\pi}{2}\right) = \cos\frac{\pi}{2}$, because the cosine function is even.

Answer: 0.