Plotting Fourier Series Partial Sums by Adding Harmonic Terms

Original tasks 1, 2 / independent work

Task 1

A sawtooth-like series has first term (2/π) sin t and second nonzero term −(1/π) sin 2t. Compute S_1 and S_2 at t = π/2 and t = π/4. Use π ≈ 3.14 and decimals to two places.

Task 2

For a series with terms (4/π) sin t, (4/(3π)) sin 3t, and (4/(5π)) sin 5t, compute S_3 at t = π/2. Use π ≈ 3.14 and decimals to two places.

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Task 3

A partial sum table has $S_1 = 0.80$ at $t = \pi/3$. The second term is $(1/\pi)\cos 2t$. Compute S_2 at $t = \pi/3$ using $\cos(2\pi/3) = -0.5$ and $\pi \approx 3.14$. Give two decimals.

Task 4

You plot S_1 and S_2 for a square wave. At $t = \pi/6$, $S_1 \approx 0.64$ and $S_2 \approx 1.06$. At $t = \pi/2$, $S_1 \approx 1.27$ and $S_2 \approx 0.85$. Describe one visible difference between the two curves near these points and state a check you would perform.