Partial sums of a Fourier series

Given the non-singular and absolutely continuous function \( f(x) = 4 / (5 - 3 \cos(x)) \), we expect a Fourier series (since \( f(x) \) is periodic, with period \( 2\pi \)) and with only cosine terms (since \( f(x) \) is even) and converging rapidly, since Fourier coefficients should drop as exponentially, not as a power law.

Here’s the Fourier sum of the constant plus \( \cos(x) \) part:
Here’s the Fourier sum of the constant plus terms through $\cos(3x)$:
Here’s the Fourier sum of the constant plus terms through $\cos(4x)$: