1. Find the general antiderivative of \( f(x) = \frac{4}{x^2} - e^{-2x} + \sin \pi x \)

2. Approximate the area underneath \( \int_0^2 x^3 + 2 \) using 4 equal subintervals with right endpoints.

3. Express \( \int_{-\pi}^\pi \cos(4x) \, dx \) as a limit of Riemann sums.

4. Use the fundamental theorem of calculus (FTC) part II to find \( \int_1^{e^2} \frac{1}{x} - 3 \).