1. Consider the function $f(x) = x^3 - 5x + 8$ over the interval $[0, 4]$.
   (a) Approximate the area between the x-axis and $f(x)$ with $n = 4$ rectangles using the right, left, and midpoint of subintervals.
   (b) Find the area between the x-axis and $f(x)$ using integration.
   (c) Which approximation from (a) is closest to the true value (b)?
2. Find $f(x)$ for each of the following:
   (a) $f'(x) = 12x^3 - 15x^2 + 10$ and $f(-1) = 8$
   (b) $f'(x) = 6e^x - 4 - 10x$ and $f(0) = -6$
   (c) $f''(x) = 60x^4 - 60x^2$ and $f(-1) = 14$ and $f'(1) = 6$
3. If possible, integrate the following functions
   (a) $\int_{-1}^{4} (x-2)e^{x^2-4x}\,dx$
   (b) $\int_{1}^{4} \frac{1}{2x-6}\,dx$
   (c) $\int \frac{\sin(1+\ln(2x)) - \sqrt{1+\ln(2x)}}{x}\,dx$
   (d) $\int_{-\infty}^{0} xe^{2+3x}\,dx$
   (e) $\int_{0}^{\pi} 2x^2\cos(x)\,dx$
   (f) $\int_{-\infty}^{0} \cos(x)\,dx$
   (g) $\int_{0}^{6} |10 - 2x|\,dx$