1. Find the most general antiderivative of $f(x) = x\sqrt{x} - \frac{2}{x^2+1} + \sin x$.
2. Find $f(x)$ if $f''(x) = -2 + 12x - 12x^2$ and $f(0) = 4$, $f'(0) = 12$.
3. A particle is moving with acceleration $a(t) = 10\sin t + 3\cos t$, $s(0) = 0$, $s(1) = 20$. Find the position function $s(t)$.
4. Find a function f such that $f'(x) = x^3$ and the line $x + y = 0$ is tangent to the graph of f.
5. Use R_n to compute the area under $y = 2x + 1$ and between $x = 0$ and $x = 1$.
6. Compute L_4 for $y = \sin x$ on $[0, \pi]$.