

1. Evaluate $\int_{-1}^1 -\sqrt{1-x^2} dx$ by interpreting it in terms of area.
2. Evaluate $\int_0^2 (2-x^2) dx$ using (a) the definition of the definite integral, and (b) the fundamental theorem of calculus.
3. Let $y = \int_1^{\sqrt[3]{x}} \cos(t) dt$. Find the critical numbers of y over the interval from $[0, 8\pi^3]$. (Hint: there should be two.)
4. Evaluate $\int_3^5 \left(2\sqrt{x} - \frac{1}{x}\right) dx$ using the fundamental theorem of calculus.