**Notes**

# Examples

**Example 1.** Compute $I = \int_{\sqrt{\pi/2}}^{\sqrt{3\pi}/2} 2x \cot(x^2)\, dx$.

**Example 2.** Compute $\int \frac{9\cos(\ln 9x)}{x}\, dx$.

**Example 3.** Compute $\int \frac{10}{x^{1/3}\left(7 + x^{2/3}\right)}\, dx$.

**Example 4.** According to demographers, the population of Accident, Maryland grew at a rate of

$$P'(t) = \frac{30e^t}{10 + e^t} \quad \text{hundreds of people per year}$$

from the time the town was established until its ironic accidental demise 7 years later. If there were 6,000 people at the town's inception, how many people lived in Accident at the time of the accident?

**Example 5.** Find the area of the region bounded by the curves

$$y = \frac{3}{2x \ln \sqrt{x}}, \quad x = e, \quad x = e^3, \quad \text{and } y = 0.$$