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1. **Evaluate** $I = \int_{-3}^{0} (1 + \sqrt{9 - x^2})\, dx$.

2. If $G(x) = \int_{1}^{x} f(z)\,dz$, and $f(x) = \int_{1}^{x^2} \sqrt{3 + u^2}\, du$, **find** $\frac{d^2}{dx^2} G(x)|_{x=1}$.

3. If a function f is continuous everywhere, $\int_{\pi}^{b} f(z)\,dz = 10$, and $\int_{\pi}^{a} f(u)\,du = 5$. **Find** $\int_{a}^{b} \pi f(s)\,ds$.

4. **Express** the following limit as a definite integral:

$$\lim_{n\to\infty}\left\{\sum_{i=1}^{n}\left[\left(\frac{\pi}{8n}\right)\left(\sec\frac{i\pi}{4n}\right)^2\right]\right\} \text{ on } \left[0,\frac{\pi}{4}\right], \text{ and then } \textbf{evaluate} \text{ it.}$$

5. **Evaluate** the <u>upper sum</u> for $f(x) = 2 + \sin x, \quad 0 \leq x \leq \pi/2$, with 3 subintervals. (show the graph)