1. Find the area bounded between the curve and the x-axis over the given interval. Include a rough sketch of the regions involved.

a) \( y = x^5; [-2, 1] \).

b) \( y = \sqrt[3]{x}; [-8, 1] \).

c) \( y = \cos(x); [0, 2\pi] \).

d) \( y = 1/x; [-4, -1] \).
2. Compute the following indefinite integrals.
   
   a) \( \int (2x - 3)(x + 4) \, dx \)

   b) \( \int \frac{x^2 - 3x + 5}{\sqrt{x}} \, dx \)

3. Find the following derivatives:

   a) \( \frac{d}{dx} \int_0^{x^2} t \cos(1 + t^3) \, dt \)

   b) \( \frac{d}{dx} \int_1^{\sqrt{x}} \ln(1 + t^2) \, dt \)
4. Find the value (or values) of $c$ from the Mean Value Theorem for the function $f(x) = \ln(x)$ on the interval $[1, e]$.

5. Use a linear approximation to estimate $\sqrt{26}$.

6. Find the limit: $\lim_{x \to 0} \frac{\sin^2(x)}{5x^2}$.