

Quiz #1

Please print your name:

Problem 1. Compute the following derivative:

$$\frac{d}{dx}\sqrt{3x^5 + \ln(x)}$$

Solution. Using the chain rule, we find:

$$\frac{d}{dx}\sqrt{3x^5 + \ln(x)} = \frac{1}{2\sqrt{3x^5 + \ln(x)}} \cdot \left(15x^4 + \frac{1}{x}\right)$$

Problem 2. Evaluate the following indefinite integral:

$$\int \sin^4(2t)\cos(2t)dt$$

Solution. We substitute $u = \sin(2t)$. Since

$$\frac{du}{dt} = 2\cos(2t),$$

we use $\cos(2t) dt = \frac{1}{2}du$ to get

$$\int \sin^4(2t)\cos(2t)dt = \frac{1}{2} \int u^4 du = \frac{1}{10}u^5 + C = \frac{1}{10}\sin^5(2t) + C.$$