Name_____ No calculators. Present neatly. Score____.

1) Evaluate or explain why it does not exist.

$$\frac{d}{dx} \int_0^{\pi/2} \sin \frac{x}{2} \cos \frac{x}{3} \, dx$$

$$\frac{d}{dx} \int_x^{\pi/2} \sin \frac{t}{2} \cos \frac{t}{3} \, dt$$

2) Evaluate or explain why it does not exist.

a)

$$\int_0^{\pi/4} (1 + \tan t)^3 \sec^2 t \, dt$$

b)

$$\int_{-\pi/4}^{\pi/4} \frac{t^4 \tan t}{2 + \cos t} \, dt$$

3)

Evaluate

$$\lim_{n \to \infty} \frac{1}{n} \left[\left(\frac{1}{n}\right)^9 + \left(\frac{2}{n}\right)^9 + \left(\frac{3}{n}\right)^9 + \cdots + \left(\frac{n}{n}\right)^9 \right]$$

4)

If f is continuous and $\int_0^2 f(x) \, dx = 6$, evaluate $\int_0^{\pi/2} f(2 \sin \theta) \cos \theta \, d\theta$.

5)

Find $\lim_{h \to 0} \frac{1}{h} \int_2^{2+h} \sqrt{1 + t^3} \, dt$.

NO ANSWERS ON THIS PAGE.