NAME: **MAC2312/Quiz-2**

READ ME FIRST: Show me all the magic very neatly on the page, for I do not read minds. Use correct notation when presenting your computations and arguments. Use complete sentences. Remember this: "=" denotes "equals" , "⇨" denotes "implies" , and "⇔" denotes "is equivalent to". Since the answer consists of all the magic transformations, do not "box" your final results. Eschew obfuscation.

1. (4 pts.) Express the following limit as a definite integral. Do not attempt to evaluate the integral.

$$L = \lim_{\max \Delta x_k \to 0} \sum_{k=1}^{n} (\sin^2(x_k^*))\Delta x_k \; ; \quad a = 0,\ b = \pi/2.$$

L =

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2. (4 pts.) (a) If $\int_{-1}^{2} f(x)\,dx = 5$ and $\int_{-1}^{2} g(x)\,dx = -3$, then

$\int_{-1}^{2} [f(x) + 2g(x)]\,dx$ =

(b) If $\int_{0}^{1} f(x)\,dx = -2$ and $\int_{0}^{5} f(x)\,dx = 1$, then

$\int_{1}^{5} f(x)\,dx$ =

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3. (6 pts.) Let $F(x) = \int_{4}^{x} (t^2+9)^{1/2}\,dt$. Find

(a) $F(4)$ =

(b) $F'(4)$ =

(c) $F''(4)$ =

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4. (3 pts.) Evaluate the given integral using Part 1 of the Fundamental Theorem of Calculus.

$$\int_{0}^{1/(2)^{1/2}} \frac{1}{(1-x^2)^{1/2}}\,dx =$$

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5. (3 pts.) Evaluate the following limit by intepreting it as a Riemann sum in which the given interval is divided into n subintervals of equal width.

$$L = \lim_{n \to +\infty} \sum_{k=1}^{n} \frac{\pi}{4n} \sec^2\left(\frac{\pi k}{4n}\right) \; ; \quad \left[0, \frac{\pi}{4}\right]$$

L =