

PRINT Your Name: _____

Quiz 7 — October 10, 2012 – Section 9 – 10:10 – 11:00

Remove everything from your desk except a pencil or pen.

Circle your answer. **Show your work.** Your work should be correct and coherent.

The quiz is worth 5 points.

Find $\int \frac{1}{4x^2 + 8x + 5} dx$. **Check your answer.**

The denominator does not factor. We complete the square

$$\int \frac{1}{4x^2 + 8x + 5} dx = \int \frac{1}{4(x^2 + 2x + \boxed{1}) + 5 - 4(\boxed{1})} dx = \int \frac{1}{4(x+1)^2 + 1} dx.$$

Let $u = 2(x + 1)$. It follows that $du = 2dx$. This integral is

$$= \frac{1}{2} \int \frac{du}{u^2 + 1} dx = \frac{1}{2} \arctan u + C = \boxed{\frac{1}{2} \arctan(2x + 2) + C}.$$

Check: The derivative of the proposed answer is

$$\frac{1}{2} \frac{2}{(2x + 2)^2 + 1} = \frac{1}{4x^2 + 8x + 5}.$$