PRINT Your Name:_____

Quiz 2 — August 26, 2011 – Section 7 – 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. **CHECK** your answer.
The quiz is worth 5 points.

Find $\int \sin^3 x \cos^2 x dx$.

Answer: Save one $\sin x$. Convert the remaining $\sin^2 x$ into cosines using $\sin^2 x + \cos^2 x = 1$. The original problem is equal to $\int (1 - \cos^2 x) \cos^2 x \sin x dx$. Let $u = \cos x$. It follows that $du = -\sin x dx$. The original problem is equal to

$$-\int (1-u^2)u^2 du = -\int (u^2 - u^4) du = -(u^3/3 - u^5/5) + C$$

$$= \boxed{-\left(\frac{\cos^3 x}{3} - \frac{\cos^5 x}{5}\right) + C}.$$

Check: The derivative of the proposed answer is

$$-(\cos^2 x(-\sin x) - \cos^4 x(-\sin x)) = \cos^2 x \sin x(1 - \cos^2 x) = \cos^2 x \sin^3 x \ \checkmark$$