PRINT Your Name:_____

Remove everything from your desk except this page and a pencil or pen.

Circle your answer. **Show your work.**   **Check** your answer.
The quiz is worth 5 points.

Find $\int \tan^3 x \sec x\,dx$.

Answer: This integral has $\tan x$ to an odd power. So, we save $\sec x \tan x$ and convert the remaining $\tan x$'s into $\sec x$'s. The integral is equal to

$$\int (\sec^2 x - 1) \sec x \tan x\,dx.$$

Let $u = \sec x$. It follows that $du = \sec x \tan x\,dx$. The integral is

$$\int (u^2 - 1)\,du = \frac{u^3}{3} - u + C = \boxed{\frac{\sec^3 x}{3} - \sec x + C.}$$

Check: The derivative of the proposed answer is

$$\sec^2 x \sec x \tan x - \sec x \tan x = \sec x \tan x (\sec^2 x - 1) = \sec x \tan x \tan^2 x. \checkmark$$