PROBLEM 4, MIDTERM 2 - SOLUTION

$$\begin{aligned}\int \tan^2(x)\cos^4(x)\csc(x)\,dx &= \int \frac{\sin^2(x)}{\cos^2(x)}\cos^4(x)\frac{1}{\sin(x)}\,dx \\ &= \int \sin(x)\cos^2(x)\,dx.\end{aligned}$$

Next perform substitution $u = \cos(x)$, so that $du = -\sin(x)dx$. Thus,

$$\int \sin(x)\cos^2(x)\,dx = -\int u^2\,dx = -\frac{u^3}{3} + C = -\frac{\cos^3(x)}{3} + C.$$

20 points. NO PARTIAL CREDIT for this problem.