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MAC 2312.5828
Cyr

Quiz 1
You must show all work to receive full credit!!

Problem 1. (2.5 pts) Evaluate $\int 5x\sec^2(9x)dx$.

IBP $u = x$ $dv = \sec^2(9x)dx$
$du = dx$ $v = \frac{1}{9}\tan(9x)$

$$5\int x\sec^2(9x)dx$$
$$= 5\left[\frac{1}{9}x\tan(9x) - \frac{1}{9}\int \tan(9x)dx\right]$$

u-sub $u = \cos(9x)$
$du = -9\sin(9x)dx$

$$= \frac{5}{9}x\tan(9x) + \frac{5}{9}\int \frac{du}{9u}$$
$$= \frac{5}{9}x\tan(9x) + \frac{5}{81}\ln|u| + C$$
$$= \boxed{\frac{5}{9}x\tan(9x) + \frac{5}{81}\ln|\cos(9x)| + C}$$

(or $\frac{5}{9}x\tan(9x) - \frac{5}{81}\ln|\sec(9x)| + C$)

Problem 2. (2.5 pts) Evaluate $\int 47\tan^3 x\sec x dx$.

$$= 47\int \tan^3 x\sec x dx = 47\int \tan^2 x\sec x\tan x dx$$
$$= 47\int (\sec^2 x - 1)\sec x\tan x dx$$

u-sub $u = \sec x$ $du = \sec x\tan x dx$

$$= 47\int (u^2 - 1)du = 47\left(\frac{u^3}{3} - u\right) + C$$
$$= \boxed{\frac{47}{3}\sec^3 x - 47\sec x + C}$$