

Quiz 9

$$\begin{aligned} \boxed{1} \quad \int \sin^3 x \cos^2 x \, dx &= \int (1 - \cos^2 x) \cos^2 x \sin x \, dx \\ u &= \cos x \quad / \quad du = -\sin x \, dx \\ &= -\int (1 - u^2) u^2 \, du = \int u^4 - u^2 \, du = \\ &= \frac{u^5}{5} - \frac{u^3}{3} + C = \frac{\cos^5 x}{5} - \frac{\cos^3 x}{3} + C \end{aligned}$$

$$\begin{aligned} \boxed{2} \quad \int \sec^4 x \tan^3 x \, dx &= \\ \int \sec^3 x (\sec^2 x - 1) \sec x \tan x \, dx & \\ \parallel \quad u = \sec x \quad du = \sec x \tan x \, dx & \\ \int u^3 (u^2 - 1) \, du = \int u^5 - u^3 \, du &= \\ \frac{u^6}{6} - \frac{u^4}{4} + C = \frac{\sec^6 x}{6} - \frac{\sec^4 x}{4} + C & \end{aligned}$$