

The symbols  $\stackrel{S}{=}$  and  $\stackrel{C}{=}$  indicate the use of the substitutions  $\{u = \sin x, du = \cos x dx\}$  and  $\{u = \cos x, du = -\sin x dx\}$ , respectively.

$$\begin{aligned} \int 6 \sin^2 x \cos^3 x dx &= \int 6 \sin^2 x \cos^2 x \cos x dx = \int 6 \sin^2 x (1 - \sin^2 x) \cos x dx \\ &\stackrel{S}{=} \int 6u^2(1 - u^2)du = \int 6(u^2 - u^4) du = 2u^3 - \frac{6}{5}u^5 + C = 2 \sin^3 x - \frac{6}{5} \sin^5 x + C \end{aligned}$$