**EXTRA**

Sometimes you can turn a problem that doesn't look like an IP problem into an IP problem, or into a u-sub problem.

Integrate $\int \cos^3(x) \, dx$.

**Solution**

1. $\cos^3(x) = \cos^2(x) \cdot \cos(x) = (1 - \sin^2(x)) \cos(x) = \cos(x) - \sin^2(x) \cos(x)$

2. $\int \cos^3(x) \, dx = \int \cos(x) \, dx - \int \sin^2(x) \cos(x) \, dx$
   
   $= \sin(x) + C_1 - \int u^2 \, du$

   Let $u = \sin(x)$, $du = \cos(x) \, dx$

   $= \sin(x) + C_1 - \frac{1}{3} u^3 + C_2$

   $= \sin(x) - \frac{1}{3} \sin^3(x) + C$  \hspace{1cm} (C = C_1 + C_2)

Compare this result with §8.2: p. 552: Example 10. The techniques applied are different, and the results APPEAR to be different, but they are NOT; they are the same!