

3. Find $\int \cos 4x \cos 5x dx$

$$\cos(A+B) = \cos A \cos B - \sin A \sin B$$

$$\cos(A-B) = \cos A \cos B + \sin A \sin B$$

$$\text{integral} = \frac{1}{2} \int (\cos 9x + \cos x) dx = \frac{1}{2} \left(\frac{\sin 9x}{9} + \sin x \right) + C$$

4. Find $\int \tan^3 x dx$. CHECK your answer.

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

$$= \frac{\tan^2 x}{2} + \ln |\cos x| + C$$

$$\checkmark: \frac{d(\text{PA})}{dx} = \frac{2 \tan x \sec^2 x}{2} - \frac{\sin x}{\cos x} = \tan x (\sec^2 x - 1) \checkmark$$