

$$11. \int \cos(\underline{4x}) \cos(\underline{-2x}) dx$$

RECALL
 $\cos u \cos v = \frac{1}{2} [\cos(u-v) + \cos(u+v)]$

$$= \int \frac{1}{2} [\cos(4x - (-2x)) + \cos(4x + 2x)] dx$$

$$= \frac{1}{2} \int (\cos 6x + \cos 2x) dx$$

$$= \frac{1}{2} \int \cos \underbrace{6x}_u dx + \frac{1}{2} \int \cos \underbrace{2x}_w dx$$

$du = 6 dx$ $dw = 2 dx$

$$= \frac{1}{2} \cdot \frac{1}{6} \int 6 \cos 6x dx + \frac{1}{2} \cdot \frac{1}{2} \int \cos 2x \cdot 2 dx$$

$$= \frac{1}{12} \int \cos u du + \frac{1}{4} \int \cos w dw$$

$$= \frac{1}{12} \sin u + \frac{1}{4} \sin w + C$$

$$= \frac{1}{12} \sin 6x + \frac{1}{4} \sin 2x + C$$