

$$I = \int_0^{\frac{\pi}{2}} \cos(2x) \cdot \cos(3x) dx \quad J = \int_0^{\frac{\pi}{2}} \sin(2x) \sin(3x) dx$$

$$I + J = \int_0^{\frac{\pi}{2}} (\cos 2x \cos 3x + \sin 2x \sin 3x) dx \quad (1)$$

$$= \int_0^{\frac{\pi}{2}} \cos(3x - 2x) dx$$

$$= \int_0^{\frac{\pi}{2}} \cos x dx$$

$$= [\sin x]_0^{\frac{\pi}{2}}$$

$$\boxed{I + J = 1}$$

إذن :

$$I - J = \int_0^{\frac{\pi}{2}} (\cos 2x \cos 3x - \sin 2x \sin 3x) dx$$

$$= \int_0^{\frac{\pi}{2}} \cos(2x + 3x) dx$$

$$= \int_0^{\frac{\pi}{2}} \cos(5x) dx$$

$$= \left[\frac{1}{5} \sin(5x) \right]_0^{\frac{\pi}{2}}$$

$$\boxed{I - J = \frac{1}{5}}$$

إذن :

$$\begin{cases} I + J = 1 \\ I - J = \frac{1}{5} \end{cases} \Leftrightarrow \begin{cases} 2I = 1 + \frac{1}{5} = \frac{6}{5} \\ 2J = 1 - \frac{1}{5} = \frac{4}{5} \end{cases}$$

$$\boxed{J = \frac{2}{5} \quad \text{و} \quad I = \frac{3}{5}}$$

إذن :

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