

$$\frac{d\beta}{dn} = \frac{3}{2} \cos 4n + \frac{3}{2} \cos 2n$$

$$\int d\beta = \frac{3}{2} \int \cos 4n \, dn + \frac{3}{2} \int \cos 2n \, dn$$

$$\beta = \frac{3}{8} \sin 4n + \frac{3}{4} \sin 2n + c$$

$$\begin{cases} \alpha' \cos^2 n + \beta' \cos \sin n = 0 \\ \alpha' \sin^2 n - \beta' \cos \sin n = 3 \cos 3n \sin n \quad (+) \end{cases}$$

$$\alpha' [\cos^2 + \sin^2] = 3 \cos 3n \sin n$$

$$\alpha' = 3 \left[\frac{1}{2} (\sin(3+1)n - \sin(3-1)n) \right]$$

$$\alpha' = \frac{3}{2} \sin 4n - \frac{3}{2} \sin 2n$$

$$d\alpha = \frac{3}{2} \int \sin 4n \, dn - \frac{3}{2} \int \sin 2n \, dn$$

$$\alpha = -\frac{3}{8} \cos 4n + \frac{3}{4} \cos 2n + c$$

$$y_p = \alpha \cos n + \beta \sin n$$

$$= \left[\frac{3}{4} \cos 2n - \frac{3}{8} \cos 4n \right] \cos n + \left[\frac{3}{8} \sin 4n + \frac{3}{4} \sin 2n \right] \sin n$$

$$= \frac{3}{4} \cos 2n \cos n - \frac{3}{8} \cos 4n \cos n + \frac{3}{8} \sin 4n \sin n$$

$$+ \frac{3}{4} \sin 2n \sin n$$

$$= \frac{3}{8} (\cos 3n + \cos n) - \frac{3}{16} (\cos 5n + \cos 3n) + \frac{3}{16} (\cos 3n - \cos 5n)$$

$$+ \frac{3}{8} (\cos n - \cos 3n) = \frac{3}{4} \cos n + \cancel{\frac{3}{8} \cos 3n} - \frac{3}{8} \cos 5n \quad (6)$$