$\frac{1}{a}$

$$\cos\left(\frac{\pi}{2}x\right) = \cos(\emptyset) - \frac{2}{\pi} \cdot \frac{2}{\pi}\sin(\emptyset) - \left(\frac{2}{\pi}\right)^4 \cos\frac{x^2}{2!} + \cdots$$

$$= 1 - \left(\frac{2}{\pi}\right)^4 \frac{x^2}{2!} + \left(\frac{2}{\pi}\right)^4 \frac{x^4}{4!} + \cdots$$

$$= \frac{\left(\frac{d}{dx}\right)^{n-1}\left[\cos\left(\frac{2}{\pi}x\right)\right]}{(n-1)!} \cdot \left(\frac{2x}{\pi}\right)^{n-1}, \qquad n = 1, 2, 3, \ldots$$

b

$$\cos\left(\frac{\pi}{2}x\right) = \cdots + \frac{(-1)^{n+1}\left(\frac{2}{\pi}\right)^{4(n-1)} x^{2(n-1)}}{2(n+1)!} + \underbrace{\frac{(-1)^n \left(\frac{2}{\pi}\right)^{4n} x^{2n}}{(2n)!}}_{R_n}$$