

$$x_a[n] = \frac{-1}{2\pi} \left[ \frac{e^{j\frac{\pi}{2}n} + \frac{\pi}{2} e^{j\frac{\pi}{2}n}}{n^2 - 1} \right] - \left[ \frac{-e^{-j\frac{\pi}{2}n} + \frac{\pi}{2} e^{-j\frac{\pi}{2}n}}{n^2 - 1} \right]$$

$$x_a[n] = \frac{-1}{2\pi(n^2 - 1)} \left[ e^{j\frac{\pi}{2}n} + e^{-j\frac{\pi}{2}n} + j\pi \left( \frac{e^{j\frac{\pi}{2}n} - e^{-j\frac{\pi}{2}n}}{j2} \right) \right]$$

$$= \frac{-1}{2\pi(n^2 - 1)} \left[ \frac{\cos\left(\frac{\pi}{2}n\right)}{2} - \pi \cos\left(\frac{\pi}{2}n\right) \right]$$

$$x_a[n] = \frac{-\cos\left(\frac{\pi}{2}n\right) \left(\frac{1}{2} - \pi\right)}{2\pi(n^2 - 1)}$$