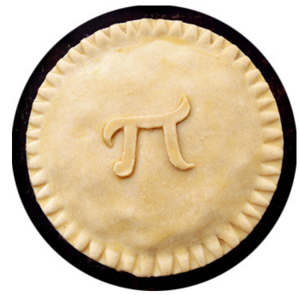

$$\sum_{k=0}^{\infty} \frac{1}{\pi^k} = 1 + \frac{1}{\pi} + \frac{1}{\pi^2} + \frac{1}{\pi^3} + \frac{1}{\pi^4} + \frac{1}{\pi^5} + \ldots = \frac{1}{1 - \frac{1}{\pi}}.$$

$$\sum_{k=4}^{\infty} \frac{1}{\pi^k} = \frac{1}{\pi^4} + \frac{1}{\pi^5} + \frac{1}{\pi^6} + \frac{1}{\pi^7} + \ldots = \frac{\textit{first term}}{1 - \textit{base}} = \frac{\frac{1}{\pi^4}}{1 - \frac{1}{\pi}}.$$

OR

$$\sum_{k=4}^{\infty} \frac{1}{\pi^k} = \sum_{k=0}^{\infty} \frac{1}{\pi^k} - 1 - \frac{1}{\pi} - \frac{1}{\pi^2} - \frac{1}{\pi^3} = \frac{1}{1 - \frac{1}{\pi}} - 1 - \frac{1}{\pi} - \frac{1}{\pi^2} - \frac{1}{\pi^3}.$$

$$\sum_{k=4}^{\infty} \frac{\sqrt{2}}{\pi^{2k}} = \frac{\sqrt{2}}{\pi^8} + \frac{\sqrt{2}}{\pi^{10}} + \frac{\sqrt{2}}{\pi^{12}} + \frac{\sqrt{2}}{\pi^{14}} + \ldots = \frac{\textit{first term}}{1 - \textit{base}} = \frac{\frac{\sqrt{2}}{\pi^8}}{1 - \frac{1}{\pi^2}}.$$

$$\sum_{k=4}^{\infty} \frac{5^k}{\pi^{2k}} = \frac{5^4}{\pi^8} + \frac{5^5}{\pi^{10}} + \frac{5^6}{\pi^{12}} + \frac{5^7}{\pi^{14}} + \ldots = \frac{\textit{first term}}{1 - \textit{base}} = \frac{\frac{5^4}{\pi^8}}{1 - \frac{5}{\pi^2}}.$$

$$\sum_{k=4}^{\infty} \frac{5^{2k}}{\pi^k} = \frac{5^8}{\pi^4} + \frac{5^{10}}{\pi^5} + \frac{5^{12}}{\pi^6} + \frac{5^{14}}{\pi^7} + \ldots \quad \text{diverges since} \quad \frac{5^2}{\pi} > 1.$$

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$$\sum_{k=0}^{\infty} \frac{\pi^k}{k!} = e^{\pi}.$$

$$\sum_{k=4}^{\infty} \frac{\pi^k}{k!} = e^{\pi} - 1 - \pi - \frac{\pi^2}{2} - \frac{\pi^3}{6}.$$

$$\sum_{k=4}^{\infty} \frac{\pi^{2k}}{k!} = \sum_{k=4}^{\infty} \frac{\left(\pi^2\right)^k}{k!} = e^{\pi^2} - 1 - \pi^2 - \frac{\pi^4}{2} - \frac{\pi^6}{6}.$$

$$\sum_{k=4}^{\infty} \frac{\sqrt{2}\,\pi^{2k}}{5^k\, k!} = \sqrt{2} \sum_{k=4}^{\infty} \frac{\left(\frac{\pi^2}{5}\right)^k}{k!} = \sqrt{2}\left[e^{\pi^2/5} - 1 - \frac{\pi^2}{5} - \frac{\pi^4}{2 \cdot 5^2} - \frac{\pi^6}{6 \cdot 5^3}\right].$$