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$$f(z) = \frac{1}{z} + \frac{2}{z+2} + \frac{3}{z+3} \quad ; \quad 2 < |z| < 3$$

$$f(z) = \frac{1}{z-1+1} + \frac{2}{z+2} \cdot \frac{\frac{1}{z}}{\frac{1}{z}} + \frac{3}{z+3} \cdot \frac{1/3}{1/3}$$

$$= \frac{1}{1+(z-1)} + \frac{1}{z} \cdot \frac{2}{1+2/z} + \frac{1}{1+\frac{1}{3}z}$$

$$= \frac{1}{(z-1)} \cdot \frac{1}{1+\frac{1}{z-1}} + \frac{2}{z} \cdot \frac{1}{1+2/z} + \frac{1}{1+\frac{1}{3}z}$$

$$= \frac{1}{(z-1)} \cdot \frac{1}{1-\left(\frac{-1}{z-1}\right)} + \frac{2}{z} \cdot \frac{1}{1-(-2/z)} + \frac{1}{1-\left(-\frac{1}{3}z\right)}$$

$$= \frac{1}{z-1} \sum_{n=0}^{\infty} \left(\frac{-1}{z-1}\right)^n + \frac{2}{z} \sum_{n=0}^{\infty} \left(-\frac{2}{z}\right)^n + \sum_{n=0}^{\infty} \left(-\frac{1}{3}z\right)^n$$

$$= \sum_{n=0}^{\infty} \frac{(-1)^n}{(z-1)^{n+1}} + \sum_{n=0}^{\infty} \frac{(-1)^n 2^{n+1}}{z^{n+1}} + \sum_{n=0}^{\infty} \frac{(-1)^n z^n}{3^n}$$

$$= \sum_{n=0}^{\infty} \left[(-1)^n \left(\frac{1}{(z-1)^{n+1}} + \frac{2^{n+1}}{z^{n+1}} + \frac{z^n}{3^n} \right) \right]$$

Daerah kekonvergenan :

$$\left|\frac{-1}{z-1}\right| < 1 \qquad \left|-\frac{2}{z}\right| < 1 \qquad \left|\frac{z}{3}\right| < 1$$

$$\left|\frac{1}{z-1}\right| < 1 \qquad |z| > 2 \qquad |z| < 3$$

$$|z-1| > 1$$

$$\therefore \quad 2 < |z| < 3$$

$$|z| > 2$$