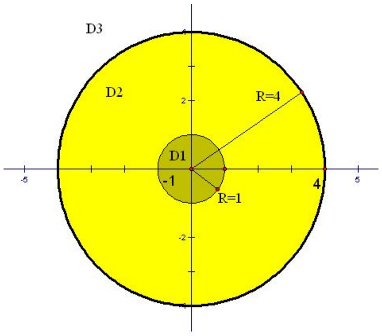
Recall, $$f(x) = \frac{1}{(x+1)(x-4)}$$ has the following Laurent Series Expansions:

(a). Centered at $z_0 = 0$:

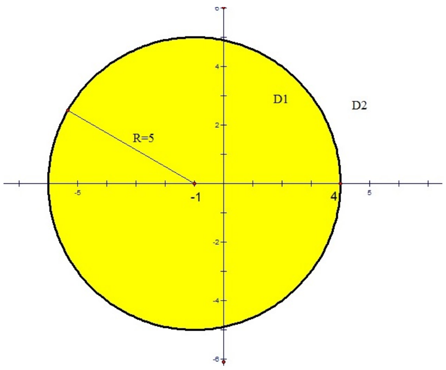


(i). $D_1: \ |z| < 1 \implies$ $$f(z) = -\frac{1}{5} \cdot \sum_{n=0}^{\infty} \left((-1)^n + \frac{1}{4^{n+1}} \right) z^n$$

(ii). $D_2: \ 1 < |z| < 4 \implies$ $$f(z) = \frac{1}{5} \sum_{n=1}^{\infty} \frac{(-1)^n}{z^n} - \frac{1}{5} \sum_{n=0}^{\infty} \frac{1}{4^{n+1}} z^n$$

(iii). $D_2: \ |z| > 4 \implies$ $$f(z) = \frac{1}{5} \cdot \sum_{n=0}^{\infty} \left(4^{n-1} + (-1)^n \right) \frac{1}{z^n}$$

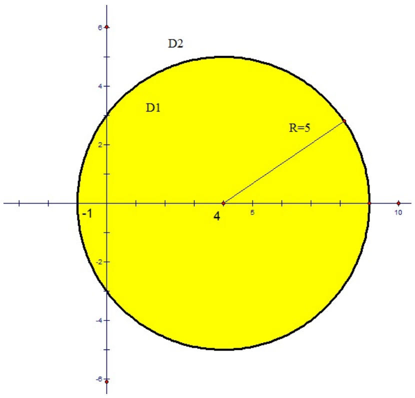
(b). Centered at $z_0 = -1$:



(i). $D_1: \ 0 < |z+1| < 5 \implies$ $$f(z) = -\frac{1}{5}\cdot\frac{1}{z+1} - \sum_{n=0}^{\infty}\frac{1}{5^{n+2}}(z+1)^n$$

(ii). $D_2: \ |z+1| > 5 \implies$ $$f(z) = \sum_{n=2}^{\infty}\frac{5^{n-2}}{(z+1)^n}$$

(c). Centered at $z_0 = 4$:



(i). $D_1: \ 0 < |z-4| < 5 \implies$ $$f(z) = \frac{1}{5}\cdot\frac{1}{z-4} + \sum_{n=0}^{\infty}\frac{(-1)^{n+1}}{5^{n+2}}(z-4)^n$$

(ii). $D_2: \ |z-4| > 5 \implies$ $$f(z) = \sum_{n=2}^{\infty}\frac{(-1)^n 5^{n-2}}{(z-4)^n}$$