

$$2. a. \quad f(z) = \frac{2z + A}{z - 2A}$$

$$f(x+iy) = \frac{2(x+iy) + 5}{(x+iy) - 2.5}$$

$$f(x+iy) = \frac{(2x+5)+i2y}{(x-10)+iy} \times \frac{(x-10)-iy}{(x-10)-iy}$$

$$f(x+iy) = \frac{(2x+5)(x-10) - (2x+5)iy + (x-10)i2y - iy \cdot i2y}{(x-10)^2 + y^2}$$

$$f(x+iy) = \frac{2x^2 - 15x - 50 - i(2xy+5y) + i(2xy-20y) + 2y^2}{x^2 - 20x + 100 + y^2}$$

$$f(x+iy) = \frac{2x^2 - 15x - 50 + 2y - i(25y)}{x^2 - 20x + 100 + y^2}$$

$$Re(f) = \frac{2x^2 - 15x - 50 + 2y}{x^2 - 20x + 100 + y^2}$$

$$Im(f) = \frac{-25y}{x^2 - 20x + 100 + y^2}$$

b.

$$f(z) = \frac{2z - 3A}{(z-A)(z^2 + 4z + 13)} \rightarrow f(z) = \frac{2z - 15}{(z-5)(z^2 + 4z + 13)}$$

Titik singular: $z - 5 = 0$
 $z = 5$

$$z^2 + 4z + 13 = 0$$

$$z_{1,2} = \frac{-b \pm \sqrt{D}}{2a}$$

$$= \frac{-4 \pm \sqrt{16 - 4 \cdot 1 \cdot 13}}{2 \cdot 1}$$

$$= \frac{-4 \pm \sqrt{16 - 52}}{2}$$

$$= \frac{-4 \pm \sqrt{-36}}{2}$$

$$= \frac{-4 \pm 6i}{2}$$

$$\begin{aligned} z_1 &= -2 + 3i \\ z_2 &= -2 - 3i \end{aligned}$$

$$z_1 = 5, \quad z_2 = -2 + 3i, \quad z_3 = -2 - 3i$$

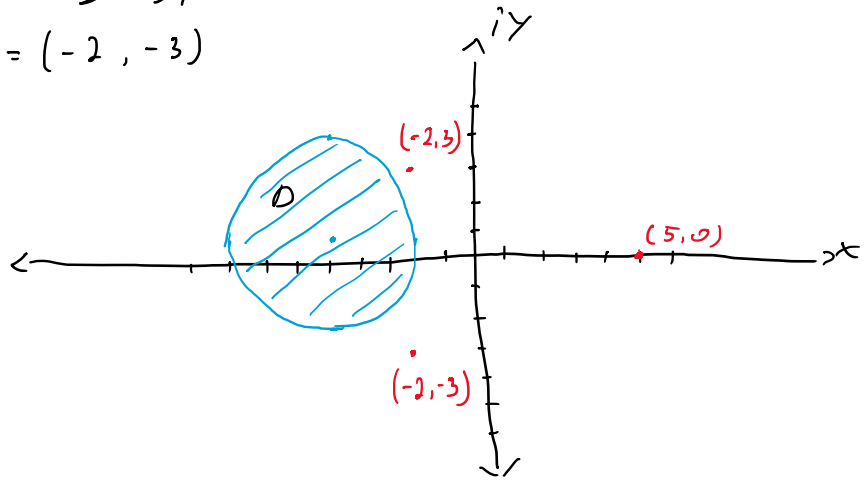
$$z_1 = (5, 0) \quad z_2 = (-2, 3) \quad z_3 = (-2, -3)$$

$$i. \quad D: |z + 5 - i| \leq 3$$

$$|z - (-5 + i)| \leq 3$$

$$TP = -5 + i = (-5, 1)$$

$$r = 3$$



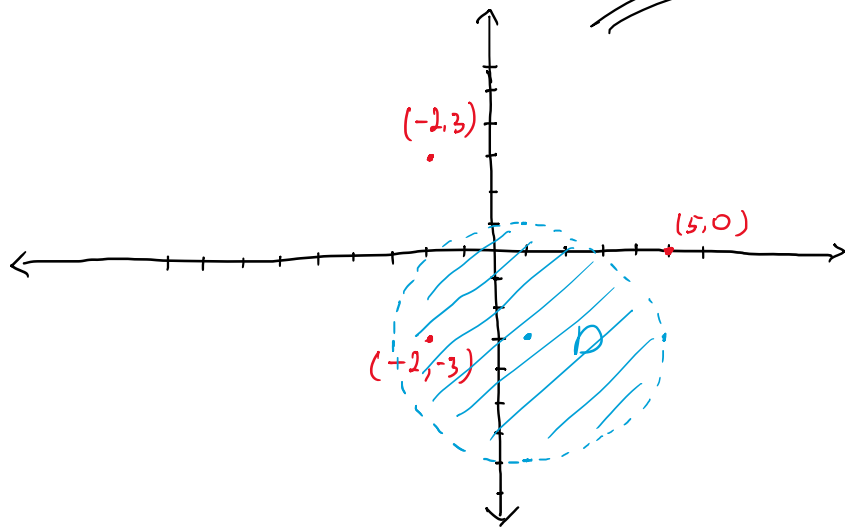
$$\therefore f(z) = \frac{2z - 15}{(z - 5)(z^2 + 4z + 13)} \text{ analitik pada } D: |z + 5 - i| \leq 3$$

$$ii. \quad D: |z - 1 + 3i| < 4$$

$$D: |z - (1 - 3i)| < 4$$

$$TP = 1 - 3i = (1, -3)$$

$$r = 4$$



$$\therefore f(z) = \frac{2z - 15}{(z - 5)(z^2 + 4z + 13)} \text{ analitik pada } D: |z - 1 + 3i| < 4 \text{ dengan}$$

$$\text{titik singular } z = -2 - 3i$$