Pole :-

(i) Find the Pole

let $f(z) = \frac{z}{(z-1)(z-4)}$

The Poles are determined by Putting the denominator equal to zero

i.e $(z-1)(z-4) = 0$

$z = 1, 4$

There are two Poles $z = 1$, and $z = 4$

let $f(z) = \frac{z^2-1}{(z-1)(z-4)(z+1)^3}$

$(z-1)(z-4)(z+1)^3 = 0$

$z = 1, 4, -1, -1, -1$

· Poles = 5

Types of Poles

(i) Simple Poles (2) order Poles

(i) Simple Poles

Ex. $f(z) = \frac{z^3}{(z-1)(z-2)(z-3)}$

$(z-1)(z-2)(z-3) = 0$

$z = 1, 2, 3$

These are Poles are simple Poles

(2) order Poles.

Ex $f(z) = \frac{z+1}{(z+1)^2}$

$(z+1)^2 = 0$

$z = -1, -1$

These are Poles are order Poles.

Ex $f(z) = \dfrac{z^2+2z+1}{(z-1)(z-2)(z-3)^3}$

$(z-1)(z-2)(z-3)^3 = 0$

$z = 1, 2, 3, 3, 3$

These are two Poles are simple Poles

$z = 1$ and $z = 2$

These are Three Poles are order Poles

$z = 3, 3, 3$