singularities. It should be noted that the δ- required is smaller the closer the singularity is to the origin.

Since we cannot find any +ve integer n such that $\lim_{z\to 0}(z-0)^n f(z) = A \neq 0$, it follows that $z=0$ is an essential singularity. Also, since every circle of radius δ with centre at $z=0$ contains singular points other than $z=0$, no matter how small we take δ, we see that $z=0$ is a non-isolated singularity.

(iii) $f(z) = \dfrac{\ln(z-2)}{(z^2+2z+2)^4}$.

The point $z=2$ is a branch point and is non-isolated singularity.

Also, since $z^2+2z+2=0$ whe
$\Rightarrow z = -1\pm i$.

It follows that
$z^2+2z+2 = (z+1+i)(z+1-i)$.
and that $z=-1\pm i$ are poles of order 4, which are isolated singularities.

3(d) Solve the following LPP

$\text{Max } Z = 2x_1 + x_2$

subject to $4x_1+3x_2 \le 12$, $4x_1+x_2 \le 8$, $4x_1-x_2 \le 8$ and $x_1, x_2 \ge 0$.