Determine if the following multistep method for approximating the solution to the IVP $y' = f(t, y), a \leq t \leq b, y(a) = \alpha$ is stable:

$w_{i+1} = 2w_{i-1} - w_i + \frac{h}{2}[5f(t_i, w_i) + f(t_{i-1}, w_{i-1})]$

For above Equation, $m=2$, $a_0 = 2$, $a_1 = -1$

then $P(\lambda) = \lambda^2 + \lambda - 2 = 0$ <= use Def 5.22

$(\lambda + 2)(\lambda - 1) = 0$

$\lambda_1 = 1$, $\lambda_2 = -2$

$\Rightarrow |\lambda_1| = 1 \leq 1$, $|\lambda_2| = 2 > 1$

$\Rightarrow$ Doesn't Statisfy Root Condition as $|\lambda_2| > 1$

$\Rightarrow$ By Def 5.23, This method is unstable