$\frac{3-2.25}{2} = 0$ $\frac{3+2.25}{2}$

$\frac{0.75}{2} = 0.375$, 2.625

CiS-2 Endsem: 3 hr (1hr theory + 2hr programming) Roll Number: 20231130 12

TASK-3: PROGRAMMING TASK

1. For solving $f(x) = 0$, we first convert to $g(x) = x$. Now for the specific $f(x) = x^2 - 3x + 1$, we considered three cases for g: $g_1(x) = x^2 - 2x + 1$, $g_2(x) = \frac{1}{3}(x^2 + 1)$ and $g_3(x) = 3 - \frac{1}{x}$. Plot phase plot showing demonstrations for each case. Since $n \to \infty$ iteration is not possible, design a 'termination condition' for stopping the iteration and demonstrate in the code.

2. Implement Newton-Raphson method, for $f(x)$ from above. Design appropriate 'termination condition', and demonstrate clearly in the code.

$x_n -$

$\frac{3+2.25}{2} = \frac{5.25}{2} = 2.625$

$\frac{9+5+6\sqrt{5} - (3+\sqrt{5}) + 1}{4}$

$\Rightarrow \frac{16 + 6\sqrt{5} - 12 - 4\sqrt{5} + 4}{4}$