

$$\text{Sol} \quad f(x) = x^2 - 5x + 1$$

$$f(0) = 1 > 0$$

$$f(1) = 1 - 5 + 1 = -3 < 0$$

$\Rightarrow$ zero lies between 0 & 1

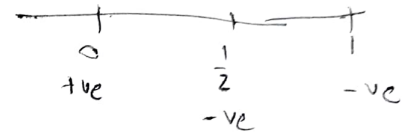
$$\text{let } m_1 = \frac{0+1}{2} = \frac{1}{2}$$

$$f(m_1) = f\left(\frac{1}{2}\right) = \left(\frac{1}{2}\right)^2 - 5 \times \frac{1}{2} + 1 = \frac{1}{4} - \frac{5}{2} + 1 \Rightarrow \frac{1-10+4}{4} = -\frac{5}{4} < 0$$

$\Rightarrow$

$$f(0) \times f\left(\frac{1}{2}\right) < 0$$

$\Rightarrow$ root lies between 0 & $\frac{1}{2}$



II let $m_2 = \frac{0+\frac{1}{2}}{2} = \left(\frac{1}{4}\right)$

$$f\left(\frac{1}{4}\right) = \left(\frac{1}{4}\right)^2 - 5 \times \frac{1}{4} + 1 \Rightarrow \frac{1}{16} - \frac{5}{4} + 1 = \frac{1-20+16}{16} = \left(-\frac{3}{16}\right) < 0$$

$$\Rightarrow f(0) \times f\left(\frac{1}{4}\right) < 0$$

$\Rightarrow$ root lies b/w 0 & $\frac{1}{4}$

III let $m_3 = \frac{0+\frac{1}{4}}{2} = \left(\frac{1}{8}\right)$

$$f\left(\frac{1}{8}\right) = \left(\frac{1}{8}\right)^2 - 5 \times \frac{1}{8} + 1 \Rightarrow \frac{1-40+64}{64} = \left(\frac{25}{64}\right) > 0$$

$$\Rightarrow f\left(\frac{1}{8}\right) \times f\left(\frac{1}{4}\right) < 0$$

$\Rightarrow$ root lies b/w $\frac{1}{4}$ & $\frac{1}{8}$

$$\Rightarrow m_4 = \frac{\frac{1}{4} + \frac{1}{8}}{2} = \frac{2+1}{8 \times 2} = \left(\frac{3}{16}\right)$$