8. Find the positive root of $x^4 - 9x^3 + 2x^2 + 2x - 7 = 0$, $x_0 = 2$

Sol^n: Here,

$$x_0 = 2$$

$$f'(x) = 4x^3 - 6x^2 + 4x + 2$$

$$x_1 = x_0 - \frac{f(x_0)}{f'(x_0)}$$

$$= 2 - \frac{-3}{6}$$

$$= 2.5$$

$$\therefore x_2 = x_1 - \frac{f(x_1)}{f'(x_1)}$$

$$= 2.5 - \frac{2.6875}{18.25}$$

$$= 2.35274$$

$$x_3 = 2.35274 - \frac{0.346771}{13.685774}$$

$$= 2.327402$$

$$x_4 = 2.327402 - \frac{0.008909}{12.986683}$$

$$= 2.326716$$

$$x_5 = 2.326716 - \frac{12.968096 \ 0.000006}{12.968096}$$

$$= 2.326715$$

$\therefore$ Root is 2.326715