

THEORY OF EQUATIONS

Find a polynomial of lowest degree which vanishes at $-2, 1, 3$ and has value -8 at $x = 2$.

Sol.

Let $f(x)$ is the required polynomial
 $f(x)$ vanishes at $x = -2, 1, 3$. (Given)
 $\Rightarrow -2, 1, 3$ are roots of $f(x)$

$\therefore (x+2), (x-1), (x-3)$ are factors of $f(x)$

$$\text{Let } f(x) = a(x+2)(x-1)(x-3) \quad \text{--- ①}$$

$$f(2) = -8$$

$$a(2+2)(2-1)(2-3) = -8 \quad \text{[from ①]}$$

$$a(4)(1)(-1) = -8$$

$$-4a = -8$$

$$a = 2$$

Put $a = 2$ in ①

$$f(x) = a(x+2)(x-1)(x-3)$$

$$f(x) = 2(x+2)(x-1)(x-3)$$

which is required polynomial.



OMG! MATHS!
The poetry of logical ideas.