Zero of a polynomial

1)
$$p(x) = \boxed{x} - 3$$

3 is the <u>zero</u> of the $p(x)$.

2)
$$p(x) = x^2 - 5x + 6$$

$$p(x)\big|_{x=2} = p(2) = 2^2 - 5(2) + 6$$

$$= 4 - 10 + 6$$

$$= 10 - 10$$

$$\boxed{= 0}$$

$$\boxed{2 \text{ is a zero of } p(x)}$$

$$p(x)\big|_{x=3} = p(3)$$

$$= 3^2 - 5(3) + 6$$

$$= 9 - 15 + 6$$

$$= 15 - 15$$

$$= 0$$

$$\boxed{3 \text{ is a zero of } p(x)}$$

Value of a polynomial at $x = a$

$$\boxed{p(a)} = \boxed{a - 3}$$

value of the polynomial at $x = a$.

$$p(x)\big|_{x=a} \quad \left\{ \; p(a) = a - 3 \right.$$

$$p(x)\big|_{x=2} = p(2) = 2 - 3 = -1$$

$$\boxed{p(x)\big|_{x=3} = p(3) = 3 - 3 = 0}$$

zero of the polynomial ←

$$p(x)\big|_{x=4} = p(4) = 4 - 3 = 1$$

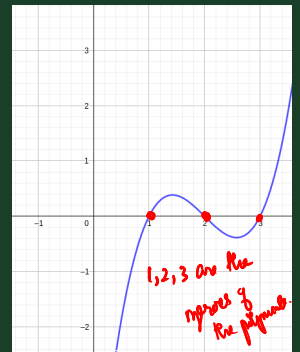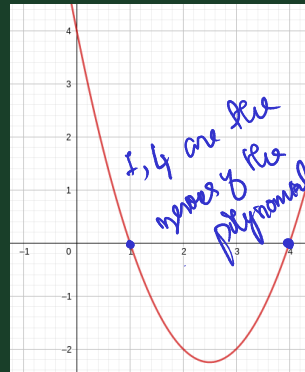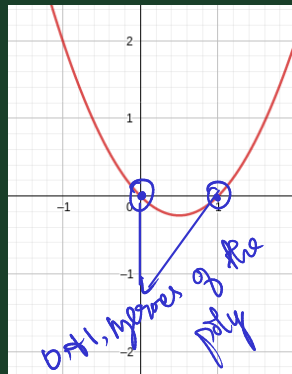$$p(x)\big|_{x=6} = p(6) = 6 - 3 = 3$$

Geometry:

the point $x = a$, such that

$p(x)$ intersects the x-axis

is a zero of the polynomial

$p(x)$.

zeroes of the polynomial $p(x) = x^2 - 5x + 6$.

No zeroes

0 & 1, zeroes of the poly

1,4 are the zeroes of the polynomial

1,2,3 are the zeroes of the polynomial

0,1,3 are the zeroes of the polynomial

0,0,3 zeroes of the polynomial
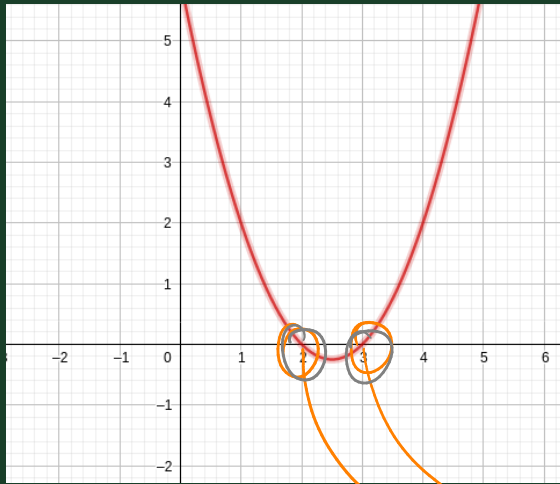
There is only one zero of the polynomial.
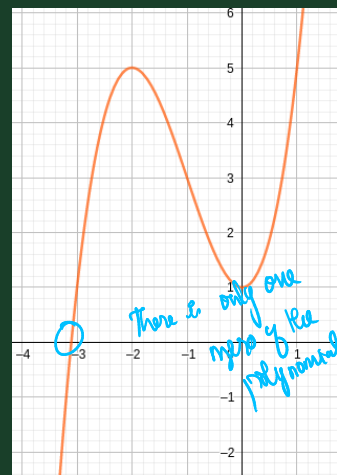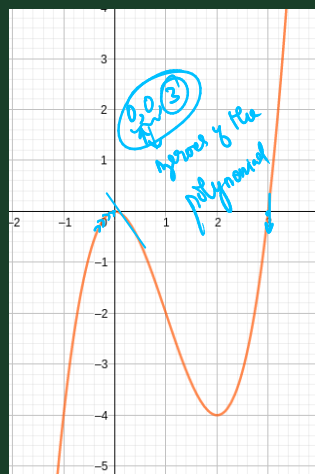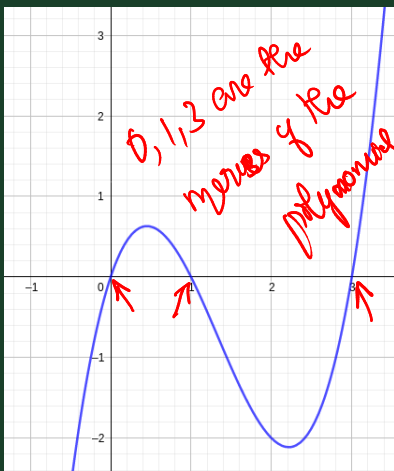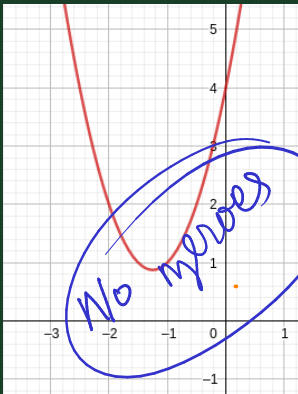
Number of zeroes of the polynomial:

linear polynomial $\longrightarrow$ Exactly one zero.

quadratic polynomial $\longrightarrow$ (Atmost) two zero.

Cubic polynomial $\longrightarrow$ Atmost three zero.
                                    (Atleast one zero must be there)

biquadratic polynomial $\longrightarrow$ Atmost Four zero.
                                        $\vdots$

Result:

1) Any polynomial of even degree has no guarantee that it will a zero.

2) Any polynomial of odd degree, must have atleast one zero. (real)