# Polynomials <br> Ex. 2.2 


$\bullet$
-
MATH

1. Let $p(x)=5 x-4 x^{2}+3$
(1) $\operatorname{But} x=0$

$$
\begin{aligned}
p(0) & =5(0)-4(0)^{2}+3 \\
& =3
\end{aligned}
$$

(II)

$$
\begin{aligned}
& \text { Rut } x=-1 \\
& \begin{aligned}
p(-1) & =5(-1)-4(-1)^{2}+3 \\
& =-5-4+3 \\
& =-6
\end{aligned}
\end{aligned}
$$

(III)

$$
\begin{aligned}
\text { Cut } x & =2 \\
p(2) & =5(2)-4(2)^{2}+3 \\
& =10-16+3 \\
& =-3
\end{aligned}
$$

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$$
\begin{aligned}
& p(y)=y^{2}-y+1 \\
& p(0)=0^{2}-0+1=1 \\
& p(1)=1^{2}-1+1=1 \\
& p(2)=2^{2}-2+1=4-2+1=3
\end{aligned}
$$

(11)

$$
\begin{aligned}
& p(t)=2+t+2 t^{2}-t^{3} \\
& p(0)=2+0+2(0)^{2}-(0)^{3}=2 \\
& p(1)=2+1+2(1)^{2}-(1)^{3}=3+2-1=4 \\
& p(2)=2+2+2(2)^{2}-(2)^{3}=4+8-8=4
\end{aligned}
$$

(III)

$$
\begin{aligned}
& p(x)=x^{3} \\
& p(0)=0^{3}=0 \\
& p(1)=1^{3}=1 \\
& p(2)=2^{3}=8
\end{aligned}
$$

(IV)

$$
\begin{aligned}
& p(x)=(x-1)(x+1) \\
& p(0)=(0-1)(0+1)=(-1) \times 1=-1 \\
& p(1)=(1-1)(1+1)=0 \times 2=0 \\
& p(2)=(2-1)(2+1)=1 \times 3=3
\end{aligned}
$$

$3(1)$

$$
\begin{aligned}
& p(x)=3 x+1 \\
& \begin{aligned}
p\left(-\frac{1}{3}\right) & =3\left(\frac{-1}{3}\right)+1 \\
& =-1+1 \\
& =0
\end{aligned}
\end{aligned}
$$

$\therefore\left(-\frac{1}{3}\right)$ is a zero of $p(x)$.
(1)

$$
\begin{aligned}
p(x) & =5 x-\pi \\
P\left(\frac{4}{5}\right) & =\frac{1}{5}\left(\frac{4}{5}\right)_{1}-\pi \\
& =4-\pi \neq 0
\end{aligned}
$$

$\therefore\left(\frac{4}{5}\right)$ is not a zero of $p(x)$.
(11)

$$
\begin{aligned}
p(x) & =x^{2}-1 \\
p(1) & =1^{2}-1 \\
& =1-1 \\
& =0
\end{aligned}
$$

$\therefore 1$ is a zero of $p(x)$.

$$
\begin{aligned}
p(-1) & =(-1)^{2}-1 \\
& =1-1 \\
& =0
\end{aligned}
$$

$\therefore(-1)$ is a zero of $\rho(x)$.
(IV)

$$
\begin{aligned}
p(x)= & (x+1)(x-2) \\
p(-1) & =(-1+1)(-1-2) \\
& =0 \times(-3) \\
& =0
\end{aligned}
$$

$\therefore(-1)$ is a zero of $p(x)$.

$$
\begin{aligned}
p(2) & =(2+1)(2-2) \\
& =3 \times 0 \\
& =0
\end{aligned}
$$

$\therefore 2$ is a zero of $p(x)$.
(v)

$$
\begin{aligned}
p(x) & =x^{2} \\
p(0) & =0^{2} \\
& =0
\end{aligned}
$$

$\therefore$ is a zero of $p(x)$.
(11)

$$
\begin{aligned}
& P(x)=l x+m \\
& \begin{aligned}
P\left(-\frac{m}{l}\right) & =e^{2}\left(-\frac{m}{\ell_{1}}\right)+m \\
& =-m+m \\
& =0
\end{aligned}
\end{aligned}
$$

$\therefore\left(-\frac{m}{l}\right) \mu$ a zero of $p(x)$.
(vil)

$$
\begin{aligned}
p(x) & =3 x^{2}-1 \\
p\left(\frac{-1}{\sqrt{3}}\right) & =3\left(\frac{-1}{\sqrt{3}}\right)^{2}-1 \\
& ={ }^{2} 3 \times \frac{1}{33}-1 \\
& =1-1
\end{aligned}
$$

$$
p\left(-\frac{1}{\sqrt{3}}\right)=0
$$

$\therefore\left(-\frac{1}{\sqrt{3}}\right)$ is a zero of $\rho(x)$.

$$
\begin{aligned}
P\left(\frac{2}{\sqrt{3}}\right) & =3\left(\frac{2}{\sqrt{3}}\right)^{2}-1 \\
& =\neq \frac{1}{2 \times \frac{4}{z_{1}}}-1 \\
& =4-1 \\
& =3 \neq 0
\end{aligned}
$$

$\therefore\left(\frac{2}{\sqrt{3}}\right)$ is not a zero of $p(x)$.
(iii)

$$
\begin{aligned}
p(x) & =2 x+1 \\
P\left(\frac{1}{2}\right) & =\frac{1}{2} \times \frac{1}{2_{1}}+1 \\
& =1+1 \\
& =2 \neq 0
\end{aligned}
$$

$\therefore\left(\frac{1}{2}\right)$ is not a zero of $p(x)$.

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$$
\begin{aligned}
& p(x)=x+5 \\
& x+5=0
\end{aligned}
$$

or $x=-5$
$(-5)$ it the zero of $p(x)$.
(II)

$$
\begin{aligned}
& p(x)=x-5 \\
& x-5=0 \\
& x=5
\end{aligned}
$$

$\therefore 5$ it the zero of $p(x)$.
(iII)

$$
\begin{aligned}
& p(x)=2 x+5 \\
& 2 x+5=0 \\
& 2 x=-5 \\
& x=-\frac{5}{2}
\end{aligned}
$$

$\therefore\left(\frac{-5}{2}\right)$ is the zero of $p(x)$.
(iv)

$$
\begin{aligned}
& p(x)=3 x-2 \\
& 3 x-2=0 \\
& 3 x=2 \\
& x=\frac{2}{3}
\end{aligned}
$$

$\therefore\left(\frac{2}{3}\right)$ is the zero of $p(x)$.
(v)

$$
\begin{aligned}
& p(x)=3 x \\
& 3 x=0 \\
& x=\frac{0}{3}
\end{aligned}
$$

or $x=0$
$\therefore 0$ is the zero of $p(x)$.
(11)

$$
\begin{aligned}
& p(x)=a x \\
& a x=0
\end{aligned}
$$

$$
\text { or } x=\frac{0}{a}
$$

or $x=0$
$\therefore 0$ it the zero of $p(x)$.
(iii)

$$
\begin{aligned}
& p(x)=c x+d \\
& c x+d=0
\end{aligned}
$$

or

$$
c x=-d
$$

$$
x=-\frac{d}{c}
$$

$\therefore\left(-\frac{d}{c}\right)$ it the zero of $p(x)$.

