PUBLIC SCHOOL DARBHANGA
SESSION (2020-21)
CLASS-IX
MATHEMATICS
POLYNOMIALS
REVISION

1. **Find the value of the polynomial $(x)=5x-4x^2+3$**

(i) $x= 0$
(ii) $x = -1$
(iii) $x = 2$

2. **Find p(0), p(1) and p(2) for each of the following polynomials:**

(i) $p(y)=y^2-y+1$
(ii) $p(t)=2+t+2t^2-t$
(iii) $p(x)=x^3$
(iv) $p(x)=(x-1)(x+1)$

3. **Following are zeroes of the polynomial, indicated against them.**

(i) $p(x)=3x+1,\ x=-\frac{1}{3}$
(ii) $p(x)=5x-\pi,\ x=\frac{4}{5}$
(iii) $p(x)=x^2-1,\ x=1,-1$
(iv) $p(x)=(x+1)(x-2),\ x=-1, 2$
(v) $p(x)=x^2,\ x=0$

4. **Find the zero of the polynomial in each of the following cases:**

(i) $p(x) = x + 5$
(ii) $p(x) = x - 5$
(iii) $p(x) = 2x + 5$
(iv) $p(x) = 3x - 2$
(v) $p(x) = 3x$
(vi) $p(x) = ax,\ a\neq0$
(vii) $p(x) = cx + d,\ c \neq 0,$ c, d are real numbers.

5. **Find the remainder when x^3+3x^2+3x+1 is divided by**

(i) $x+1$
(ii) $x+\pi$

(iii 5
$+2x$

ANSWER KEY

1. Find the value of the polynomial $(x)=5x-4x^2+3$

(i) x= 0

(ii) x = – 1

(iii) x = 2

Solution:

Let $f(x)= 5x-4x^2+3$

(i) When x=0

$f(0)=5(0)+4(0)^2+3$

$=3$

(ii) When x= -1

$f(x)=5x-4x^2+3$

$f(-1)=5(-1)-4(-1)^2+3$

$=-5-4+3$

$=-6$

(iii) When x=2

$f(x)=5x-4x^2+3$

$f(2)=5(2)$

$-4(2)^2+3$

$=10-16+3$

$=-3$

2. Find p(0), p(1) and p(2) for each of the following polynomials:

(i) $p(y)=y^2-y+1$

Solution:

$p(y)=y^2-y+1$

$\therefore p(0)=(0)^2-(0)+1=1$

$p(1)=(1)^2-(1)+1=1$

$p(2)=(2)^2-(2)+1=3$

(ii) $p(t)=2+t+2t^2-t^3$

Solution:

$p(t)= 2+t+2t^2-t^3$

$\therefore p(0)=2+0+2(0)^2-(0)^3=2$

$p(1)=2+1+2(1)^2-(1)^3=2+1+2-1=4$ $p(2)=2+2+2(2)^2-(2)^3=2+2+8-8=4$

(iii)$p(x)=x^3$

Solution:

$p(x)=x^3$
$\therefore p(0)=(0)^3=0$
$p(1)=(1)^3=1$
$p(2)=(2)^3=8$

(iv)p(x)=(x−1)(x+1)

Solution:

$p(x)=(x-1)(x+1)$
$\therefore p(0)=(0-1)(0+1)=(-1)(1)=-1$
$p(1)=(1-1)(1+1)=0(2)=0$
$p(2)=(2-1)(2+1)=1(3)=3$

3. **Verify whether the following are zeroes of the polynomial, indicated against them. (i) $p(x)=3x+1, x=-\frac{1}{3}$**

Solution:

For, $x=-\frac{1}{3}$, $p(x)= 3x+1=-2$

$\therefore p(-\frac{1}{3})=3(-\frac{1}{3})+1=-1+1=$

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

(ii) $p(x)=5x-\pi, x=\frac{4}{5}$

Solution:

For, $x=\frac{4}{5}$ $p(x)=5x-\pi$

$\therefore p(\frac{4}{5})=5(\frac{4}{5})-$

$\therefore \frac{4}{5}$ is not a zero of px

(iii) $p(x)=x^2-1$, x=1, −1

Solution:

For, x=1, −1;
$p(x)=x^2-1$
$\therefore p(1)=1^2-1=1-1=$
0 p(−1)
=
$(-1)^2-1=1-1=0$
∴1, −1 are zeros of p(x).

(iv)p(x)=(x+1)(x–2), x= −1, 2

Solution:

For, x=−1,2;

p(x)=(x+1)(x
–2)
∴p(−1)=(−1+1)(−1–2)
=((0)(−3))=0
p(2)=(2+1)(2–2)=(3)(0)=0
∴−1,2 are zeros of p(x).

(v) $p(x)=x^2$, x=0

Solution:

For, x=0 p(x)=
x^2 $p(0)=0^2=0$
∴0 is a zero of p(x).

4. Find the zero of the polynomial in each of the following cases:

(iii)p(x) = x + 5

Solution:

p(x)=x+5
⇒x+5=0
⇒x=−5
∴-5 is a zero polynomial of the polynomial p(x).

(iv)p(x) = x – 5

Solution:

p(x)=x−5
⇒x−5=0
⇒x=5
∴5 is a zero polynomial of the polynomial p(x).

(iii)p(x) = 2x + 5

Solution:

p(x)=2x+5
⇒2x+5=0
⇒2x=−5
⇒x=− $\frac{5}{2}$

∴x= − =− $\frac{5}{2}$ is a zero polynomial of the polynomial p(x).

(iv)p(x) = 3x – 2

Solution:

p(x)=3x–2
⇒3x−2=0
⇒3x=2

⇒x=$\frac{2}{3}$

∴x=$\frac{2}{3}$ is a zero polynomial of the polynomialpx

(v) p(x) = 3x

Solution:

p(x)=3x

⇒3x=0

⇒x=0

∴0 is a zero polynomial of the polynomial p(x).

(vi)p(x) = ax, a≠0

Solution:

p(x)=ax

⇒ax=0

⇒x=0

∴x=0 is a zero polynomial of the polynomial p(x).

(vii) p(x) = cx + d, c ≠ 0, c, d are real numbers.

Solution:

p(x)= cx + d

⇒ cx + d =0

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

$\therefore x=\frac{-d}{c}$ is a zero polynomial of the polynomial p(x).

5. Find the remainder when x^3+3x^2+3x+1 is divided by

(iii)x+1

Solution:

x+1

=0

⇒x=−1

∴Remainder:

$p(-1)=(-1)^3+3(-1)^2+3(-1)+1$

$=-1+3-3+1$

$=0$

(iv) x

+

π

Solution:

$x+\pi$
$=0$
$\Rightarrow x=$
$-\pi$
$\therefore$Remainder:
$p(0)=(-\pi)^3+3(-\pi)^2+3(-\pi)+1$
$=-\pi^3+3\pi^2-3\pi+1$

(v) 5+2x

Solution:

$5+2x=0$
$\Rightarrow 2x=-5$
$\Rightarrow x=-\frac{5}{2}$