POLYNOMIALS
PPT-2

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 02
CHAPTER NAME : POLYNOMIALS

Learning outcome

1..Students will be able to Students will be able to **know the r**elationship between zeroes and coefficients of a quadratic polynomial

2.. Students will be able to solve questions involving relationship between zeroes and coefficients of a quadratic polynomial

PREVIOUS KNOWLEDGE TEST

○ 1*A __polynomial p(x) in one variable__ x* is an algebraic expression in x of the form

$p(x) = a_nxn + _{an-1}xn-1 + \ldots + a2x2 + ax + a_0,$

where $a_0, a_1, a_2, \ldots, a_n$ are **constants(realnumbers**) and $a_n \neq 0$.

2. Every **linear polynomial** in one variable has a **unique zero**, a non-zero constant polynomialhas no zero, and every real number is a zero ofthe zero polynomial

3 A **quadratic polynomial** can have at most **2 zeroes** and **a cubic polynomia**l can have atmost **3 zeroes**

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4. General form of linear polynomials $ax + b \ where \ a \neq 0$

5. General from of quadratic polynomials $ax^2 + bx + c$ where a≠O

6. General form of cubic polynomial$ax^3 + bx^2 + cx + d, where a \ a \neq 0$

Relationship between zeros and coefficient
https://youtu.be/5FR1Hix5WLk {8.06}

: Find the zeroes of the quadratic polynomial x^2 + 7x + 10, and verify the relationship between the zeroes and the coefficients.

Solution : We have x^2 + 7x + 10

 = (x + 2)(x + 5)

So, the value of x^2 + 7x + 10 is zero when x + 2 = 0 or x + 5 = 0, i.e., when x = − 2 or

x = −5. Therefore, the zeroes of x^2 + 7x + 10 are − 2 and − 5.

Now,

sum of zeroes = (−2 (−5) = -(7) =- (Coefficient of x)/ Coefficient of x^2

product of zeroes = -2 X(-5) =10 =10/1= Constant term/ Coefficient of x^2

(iii) $6x^2 - 3 - 7x$

$= 6x^2 - 7x - 3$

$= 6x^2 - 9x + 2x - 3$

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

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

The value of $6x^2 - 7x - 3$ is zero if $3x + 1 = 0$ or $2x - 3 = 0$.

$\Rightarrow x = -\dfrac{1}{3}$ or $x = \dfrac{3}{2}$.

Therefore, the zeroes of $6x^2 - 7x - 3$ are $-\dfrac{1}{3}$ and $\dfrac{3}{2}$. Now

Sum of zeroes $= -\dfrac{1}{3} + \dfrac{3}{2} = \dfrac{-2 + 9}{6} = \dfrac{7}{6} = \dfrac{-(-7)}{6} = \dfrac{-(\text{Cofficient of } x)}{\text{Cofficient of } x^2}$

Product of zeroes $= \left(-\dfrac{1}{3}\right) \times \dfrac{3}{2} = -\dfrac{1}{2} = \dfrac{-3}{6} = \dfrac{\text{Constant term}}{\text{Cofficient of } x^2}$

: Find a quadratic polynomial, the sum and product of whose zeroes are – 3 and 2, respectively.

Solution : Let the quadratic polynomial be ax^2 + bx + c, and its zeroes be α and β. We have α + β = – 3 = -b /a , and αβ = 2 = c/ a . If a = 1, then b = 3 and c = 2.

So, one quadratic polynomial which fits the given conditions is x^2 + 3x + 2..

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AHA

1. If α, β are the two zeroes of the polynomial $6y^2 - 7y + 2$, find a quadratic polynomial whose zeroes are $\underline{1/}\ \alpha$ and $1/\ \beta$.

2. . If α,β are the two zeroes of the polynomial $3x^2 - 4x + 1$, find a quadratic polynomial whose zeroes are $\alpha 2$ & $\beta 2$.

3. If α,β are the two zeroes of the polynomial $3x^2 + 2x + 1$, find the quadratic polynomial whose zeroes are $1 - \alpha/1 + \alpha$ & $1 - \beta/\ 1 + \beta$

4. . If α,β are the two zeroes of the polynomial $2x^2 - 5x + 7$, find the quadratic polynomial whose zeroes are $2\alpha + 3\beta$ and $3\alpha + 2\beta$.

THANKING YOU
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