ASSIGNMENT - 6   EX 2.2   CLASS 10th

➤ If $\alpha\ (alpha)\ and\ \beta\ (beta)$ are zeroes of a quadratic polynomial $P(x) = ax^2 + bx + c$, $a \neq 0$.

Sum of zeroes $= \alpha + \beta = \dfrac{-(coefficient\ of\ x)}{coefficient\ of\ x^2} = \dfrac{-b}{a}$

Product of zeroes $= \alpha\beta = \dfrac{constant\ term}{coefficient\ of\ x^2} = \dfrac{c}{a}$

Example: Find the zeroes of polynomial $x^2 - 2x - 8$ and verify the relationship between zeroes and coefficients.

Solutions: $x^2 - 2x - 8 = x^2 - 4x + 2x - 8$

$\qquad\qquad\quad = x\ (x-4) + 2\ (x-4)$

$\qquad\qquad\quad = (x+2)\ (x-4)$

$\qquad \therefore\ x+2 = 0\ or\ x - 4 = 0$

$\qquad$ So, x = -2 and x = 4

$\therefore\quad$ Value of $x^2 - 2x - 8$ is zero when x = -2 or x = 4

$\therefore\quad$ Sum of zeroes $= -2 + 4 = 2 = \dfrac{-(-2)}{1} = \dfrac{-(coefficient\ of\ x)}{coefficient\ of\ x^2} = \dfrac{-b}{a}$

$\qquad$ Product of zeroes $= -2 \times 4 = -8 = \dfrac{-8}{1} = \dfrac{constant\ term}{coefficient\ of\ x^2} = \dfrac{c}{a}$

➤ If we know sum of zeroes and product of zeroes, we can find quadratic polynomial

$\qquad$ Quadratic polynomial $= x^2 - S\ x + P$

Here, S -- sum of zeroes $= \alpha + \beta$

$\qquad$ P --- Product of zeroes $= \alpha\ \beta$

Example: Find quadratic polynomial if sum of zeroes is $\frac{1}{4}$ and product of zeroes is -1 .

Solution: $S = \alpha + \beta = \frac{1}{4}$, $P = \alpha\ \beta = -1$

$\qquad \therefore$ Quadratic Polynomial $= x^2 - Sx + P$

$\qquad\qquad\qquad\qquad\quad = x^2 - \frac{1}{4}x + (-1)$

$\qquad\qquad\qquad\qquad\quad = x^2 - \frac{x}{4} - 1$

If we want to remove 4 from the denominator then multiply quadratic polynomial by 4

Quadratic polynomial $= 4\times x^2 - 4 \times \frac{x}{4} - 4 \times 1$

$\qquad\qquad\qquad\qquad\quad = 4\ x^2 - x\ - 4$

Both answers are correct.

HOME WORK :

1. Find the Zeroes of polynomial and verify relationship between zeroes and coefficient.
   a) $6\ x^2 - 7x\ - 3$ $\qquad\qquad$ b) $3x^2 - x - 4$
2. If sum of zeroes is 4 and product of zeroes is 1, find the quadratic polynomial.