Std. - 10^{th} (CBSE) 19th June.'17

Solution of PT-2M (Maths)

Polynomials & word Problems

Section : A

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

$\therefore$ deg. $(-x^5-x^4+x^3+1) = 5.$

(2) Parabala

(3) x^2- (Sum of zeroes) x + (Product of zeroes)

$= x^2-7x+11.$

(4) Sum of zeroes $= \alpha+\beta = 2+(-6) = -4$

product of zeroes $= \alpha\beta = (2)(-6) = -12$

Polynomial $= x^2-(\alpha+\beta)x+\alpha\beta$

$= x^2-(-4)x+(-12)$

$= x^2+4x-12.$

(5) 3

(6) Zero

Section - B

(7) let one of the number $= x$
another number $= y$

→ The difference between two numbers is 26.
i.e. $x - y = 26$ — (i)

→ One number is 3 times the other.
i.e. $x = 3y$ — (ii)

→ By using (i) & (ii) we have,

$3y - y = 26$

$\therefore 2y = 26$

$\therefore \boxed{y = 13.}$

→ Substitute $y=13$ in (ii) we get,

$x = 3(13)$

$\therefore \boxed{x = 39}$

→ Hence, the numbers are 39 & 13.

(8) $x^2 + 13x + 36 = x^2 + 4x + 9x + 36$
$= x(x+4) + 9(x+4)$
$= (x+4)(x+9)$

→ So, the value of $x^2+13x+36$ is zero when,
$x+4 = 0$ or $x+9 = 0$
i.e. $x = -4$ or $x = -9$.

→ So, the zeroes of $x^2+13x+36$ are $-4, -9$.

Sum of the zeroes $= -4-9 = -13 = \frac{-\text{coeff. of } x}{\text{coeff. of } x^2}$

Product of zeroes $= (-4)(-9) = 36 = \frac{\text{constant term}}{\text{coeff. of } x^2}$

Section - C

(9) Since α & β are the zeroes of ax^2+bx+c i.e. x^2-x-2.

So, $\alpha+\beta = \frac{-b}{a} = \frac{-(-1)}{1} = 1$

& $\alpha\beta = \frac{c}{a} = \frac{-2}{1} = -2$.

→ To find polynomial whose zeroes are $2\alpha+1$ and $2\beta+1$:-

Sum of zeroes $= 2\alpha+1+2\beta+1$

$= 2(\alpha+\beta)+2$

$= 2(1)+2$

$= 4$

Product of zeroes $= (2\alpha+1)(2\beta+1)$

$= 4\alpha\beta+2\beta+2\alpha+1$

$= 4\alpha\beta+2(\alpha+\beta)+1$

$= 4(-2)+2(1)+1$

$= -8+2+1$

$= -5$.

∴ Required polynomial is

$x^2 - (\text{Sum of zeroes})x + \text{Product of zeroes}$

$= x^2-4x-5$.

(10) As α & β are the zeroes of x^2-6x+a

then, $\alpha+\beta = 6$ —(i) & $\alpha\beta = a$. —(ii)

∴ $\beta = 6-\alpha$.