NORTH-EX PUBLIC SCHOOL (Session 2020-21)
Class - IX
Subject - MATHS
Unit/Chapter -2 POLYNOMIALS
Topics- Factorisation of Polynomials
Worksheet No -6

*Note- Before attempting the question and answers you must check the link given below which will help you understand the chapter thoroughly.

You can download the assignment or if you do not have the facility to get printout then you can ask your ward to copy the assignment in a simple notebook and must do question and answers in the notebook.

Link: https://youtu.be/r5c6gSVHL78

NOTES

Factorisation of Polynomials:

Factorisation of quadratic polynomial ax^2+bx+c by splitting the middle term as follows:

To split the middle term bx, we have to take two numbers . Let m and n are two numbers.

So numbers should be considered as:

1. **$m \pm n$= coefficient of x , which is b (means when we add or subtract , result should be +b)**
2. **m x n = product of a and c (coefficients of x^2 and constant term)**

Remember that coefficient should be considered with their signs(+ve and –ve)

Example:

Factorise x^2-5x+6 by splitting the middle term.

Sol: x^2-5x+6 , here a=1, b=-5, c=6 (coefficients of x^2, x and constant)

Now, Take two numbers m and n and

Consider, $m \pm n= -5$, $mxn=1x6=6$

so m and n are -3 and -2.(-3-2=-5 and (-3)x (-2)=6)

By splitting the middle term

x^2-5x+6

x^2 -3x -2x+6

x (x-3) -2(x-3) (note that common factors should be same in both pairs)

(x-3) (x-2) (taking common x-3)

So (x-3) and (x-2) are factors of quadratic polynomial.

Example 2: Factorise $x^3-23x^2+142x-120$

Sol: Here look factors of 1 x (-120) =-120 (coeff. of x^3 and constant)

All Factors are $\pm 1, \pm 2, \pm 3, \pm 4, \pm 5, \pm 6, \pm 10, \pm 12, \pm 15, \pm 20, \pm 24, \pm 30, \pm 60$

Now try x=1 substitute in polynomial

P(1)= 1^3-23 x1^2 +142 x1 -120 =0

So x=1 satisfies p(x)

x-1 is factor of p(x)

Now divide p(x) by x-1

x-1 | x^3-23x^2+142x -120 | x^2-22x+120

x^3 –x^2

\- +

-22x^2 +142x -120

-22x^2 +22x

\+ -

120x -120

120x -120

\- +

0

Now factorise x^2-22x+120

X^2-12x -10x +120 (-12-10=-22, (-12) x(-10)=120)

x(x-12) -10(x-12) taking common (x-12)

(x-12) (x-10)

So all factors are (x-1) (x-12) (x-10)

WORKSHEET-6

1. Factorise $3x^2$-x-4
2. Factorise $2x^2$+7x+3
3. Factorise $12x^2$-7x+1
4. Factorise x^3-$3x^2$-9x-5
5. Examine whether x+2 is a factor of x^3+$3x^2$+5x+6 .

ANSWERS

1. **Factors are**(3x-4) (x+1)
2. **Factors are**(x+3) (2x+1)
3. **Factors are**(3x-1) (4x-1)

4. **Hint: x=-1** satisfies p(x), x+1 is factor of p(x) . Now divide p(x) by (x+1).We get x^2-4x-5. It's factors are (x-5) (x+1)
5. X+2 is factor of p(x) because p(-2) =0