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Live Training Sessions

Date :	Oct-26-2024	Board / STD	CBSE / 8
Subject :	Mathematics	Topic :	Factorization & Doubts for 12.2

Doubts:

12.2:

$$a^2 + 8a + 16$$

$$(a)^2 + 2 \times a \times 4 + (4)^2$$

$$(a+4)^2$$

$(a+b)^2 =$	$a^2 + b^2 + 2ab$	$\rightarrow 3$
$(a-b)^2 =$	$a^2 + b^2 - 2ab$	$\rightarrow 3$
$(a-b)(a+b) =$	$a^2 - b^2$	$\rightarrow 2$

factorised

$$\boxed{ax^2 + bx}$$

$$x(ax + b)$$

$$x$$

$$(ax + b)$$

$$x^2 - 324$$

$$x^2 - 2 \times 2 \times 3 \times 3 \times 3 \times 3$$

$$\rightarrow \boxed{(\quad) \times (\quad)}$$

$$(x^2) - (18)^2$$

$$(a+b)^2 = a^2 + b^2 + 2ab$$

$$(a-b)^2 = a^2 + b^2 - 2ab$$

$$(a-b)(a+b) = a^2 - b^2$$

$$\boxed{(x-18)(x+18)}$$

$$729 - 324x^2$$

$$\downarrow$$

$$(27)^2 - (18x)^2$$

$$\rightarrow \boxed{(27 - 18x)(27 + 18x)}$$

$$\underline{2n^3} + \underline{2ny^2} + \underline{2nz^2}$$

$$2n(n^2 + y^2 + z^2)$$

$$\underbrace{5y^2 - 20y}_{\quad} - \underbrace{8z + 2yz}_{\quad}$$



Factorization of Form $ax^2 + bx + c$ where $a = 1$:

To factor a quadratic expression of the form $x^2 + bx + c$, we look for two numbers that:

1. Multiply to c (the constant term).
2. Add up to b (the coefficient of x).

The expression factors as:

$$x^2 + bx + c = (x + m)(x + n)$$

where m and n are the numbers that satisfy the conditions above.

Steps to Factor $x^2 + bx + c$:

1. **Identify b and c :** Write down the values of b and c from the expression.
2. **Find Two Numbers:** Find two numbers m and n such that:
 - $m \times n = c$
 - $m + n = b$
3. **Write in Factored Form:** Once m and n are found, write the expression as $(x + m)(x + n)$.



Example

Factor $x^2 + 7x + 10$:

- Here, $b = 7$ and $c = 10$.
- Find two numbers that multiply to 10 and add up to 7:
 - The numbers 2 and 5 work, because $2 \times 5 = 10$ and $2 + 5 = 7$.
- Write the expression as:

$$x^2 + 7x + 10 = (x + 2)(x + 5)$$

factorize \Rightarrow $|x^2 - 5x + 6|$

$(x)^2 - 2 \times x \times \sqrt{6} + (\sqrt{6})^2$

\times identifying \times

$ax^2 + bx + c$

$a, b, c = \text{constant values}$

$x \Rightarrow \text{variable}$

$x^2 - 5x + 6$

$x^2 - (2 + 3)x + 6$

$\rightarrow x^2 - 2x - 3x + 6$

$x(x - 2) - 3(x - 2)$

$(x - 2)(x - 3)$

$(c) \rightarrow$

2	6
3	3
	1

$2, 3$

$2 \times 3 = 6$

$$\begin{array}{l}
 x^2 - 5x - 6 \\
 \downarrow \\
 x^2 - 2x - 3x - 6 \\
 \underline{x(x-2) + 3(x+2)} \\
 \underline{x(x-2) + 3(x+2)}
 \end{array}
 \quad
 \begin{array}{r}
 2 \overline{) 6} \\
 \underline{3} \\
 3 \\
 \underline{3} \\
 0
 \end{array}
 \quad
 \begin{array}{r}
 6 \overline{) 18} \\
 \underline{6} \\
 12 \\
 \underline{12} \\
 0
 \end{array}$$

2 x 3

$$\begin{array}{l}
 x^2 - 5x - 6 \\
 \downarrow \\
 x^2 - (6-1)x - 6 \\
 \rightarrow x^2 - 6x + 1x - 6 \\
 \underline{x(x-6) + 1(x-6)} \\
 \underline{(x+1)(x-6)}
 \end{array}
 \quad
 (6, 1) \quad (5)$$

$$\begin{array}{l}
 x^2 - \frac{15}{4} + 50 \\
 \downarrow \\
 \boxed{10} + 5 \\
 2 \times 5 \times 5
 \end{array}$$

END

