

Class - VIII

FACTORIZATION

Sub: - Mathematics.

Factorisation using Identities

We know that $(a+b)^2 = a^2 + 2ab + b^2$ ——— (I)

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

$$a^2 - b^2 = (a+b)(a-b)$$
 ——— (III)

Question; ① Factorise; $x^2 + 8x + 16$

Observe the Expression, It has three terms, It's first and third terms are perfect squares with positive sign before the middle term, so It is of the form $a^2 + 2ab + b^2$

where $a = x$ & $b = 4$

$$\begin{aligned} a^2 + 2ab + b^2 &= (x)^2 + 2 \times (x) \times (4) + (4)^2 \\ &= (x + 4)^2 \end{aligned}$$

Question; ② Factorise $4y^2 - 12y + 9$

We observed that It's first and third terms are perfect squares with positive sign before the middle term. So It is of the form $a^2 + 2ab + b^2$

where $a = 2y$ & $b = 3$

$$\begin{aligned} a^2 + 2ab + b^2 &= (2y)^2 - 2 \times (2y) \times (3) + (3)^2 \\ &= (2y - 3)^2 \end{aligned}$$

Question; ③ Factorise $x^2 - 256$.

We observed that It's has two terms, It's first and second terms are perfect squares with positive sign. Thus the given expression fit the Identity III.

$a^2 - b^2 = (a+b)(a-b)$, where $a = x^2$ & $b = 16$

$$\begin{aligned} x &= (x^2 + 16)(x^2 - 16) \\ &= (x^2 + 16)(x^2 - 4^2) \\ &= (x^2 + 16)(x + 4)(x - 4) \end{aligned}$$