

## Factorisation of Algebraic Expressions Ex 5.2 Q22 Answer:

The given expression to be factorized is

$$a^3 + 3a^2b + 3ab^2 + b^3 - 8$$

Recall the well known formula

$$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

The given expression can be written as

$$a^3 + 3a^2b + 3ab^2 + b^3 - 8 = (a+b)^3 - (2)^3$$

Recall the formula for difference of two cubes

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

Using the above formula and taking common -2 from the last two terms, we get

$$a^{3} + 3a^{2}b + 3ab^{2} + b^{3} - 8 = \{(a+b) - 2\}\{(a+b)^{2} + (a+b) \cdot 2 + (2)^{2}\}$$
$$= (a+b-2)[\{(a)^{2} + 2 \cdot a \cdot b + (b)^{2}\} + (2a+2b) + 4\}$$
$$= (a+b-2)(a^{2} + 2ab + b^{2} + 2a + 2b + 4)$$

We cannot further factorize the expression.

So, the required factorization of  $a^3 + 3a^2b + 3ab^2 + b^3 - 8$  is  $(a+b-2)(a^2 + 2ab + b^2 + 2a + 2b + 4)$ 

## Factorisation of Algebraic Expressions Ex 5.2 Q23 Answer:

The given expression to be factorized is

$$8a^3 - b^3 - 4ax + 2bx$$

The given expression can be written as

$$8a^3 - b^3 - 4ax + 2bx = \{(2a)^3 - (b)^3\} - 4ax + 2bx$$

Recall the formula for difference of two cubes

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

Using the above formula and taking common -2x from the last two terms, we get

$$8a^3 - b^3 - 4ax + 2bx = (2a - b)\{(2a)^2 + 2ab + (b)^2\} - 2x(2a - b)$$
$$= (2a - b)(4a^2 + 2ab + b^2) - 2x(2a - b)$$

Take common (2a-b). Then we have,

$$8a^3 - b^3 - 4ax + 2bx = (2a - b)\{(4a^2 + 2ab + b^2) - 2x\}$$
$$= (2a - b)(4a^2 + 2ab + b^2 - 2x)$$

We cannot further factorize the expression.

So, the required factorization of  $8a^3 - b^3 - 4ax + 2bx$  is  $(2a - b)(4a^2 + 2ab + b^2 - 2x)$ 

## Factorisation of Algebraic Expressions Ex 5.2 Q24 Answer:

(i) The given expression is

$$173 \times 173 \times 173 + 127 \times 127 \times 127$$

Assume a = 173 and b = 127. Then the given expression can be rewritten as

$$\frac{a^3+b^3}{a^2-ab+b^2}$$

Recall the formula for sum of two cubes

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

Using the above formula, the expression becomes

Using the above formula, the express 
$$\frac{a^3 + b^3}{a^2 - ab + b^2} = \frac{(a+b)(a^2 - ab + b^2)}{a^2 - ab + b^2}$$
Note that both  $a$  and  $b$  are positive.

Note that both a and b are positive. So, neither  $a^3 + b^3$  nor any factor of it can be zero.

Therefore we can cancel the term  $(a^2 - ab + b^2)$  from both numerator and denominator. Then the expression becomes

$$\frac{(a+b)(a^2 - ab + b^2)}{a^2 - ab + b^2} = a+b$$
= 173+127
= 300

\*\*\*\*\*\*\* END \*\*\*\*\*\*\*\*