Factorization When a Common Monomial Factor Occurs in Each Term

Understanding of Factorization When a Common Monomial Factor Occurs in Each Term

- Factorization means writing an expression as a product of factors.
- When each term has a common monomial factor, we can take that common factor outside a bracket.
- This simplifies the expression and makes it easier to solve or further factorize.

Important Points

- Identify the common numerical and variable part from each term.
- Take the common monomial factor outside the bracket.
- Write the remaining terms inside the bracket.
- Always verify by expanding to check if the factorization is correct.
- Common factor could involve a number, a variable, or both.

Examples with Solutions

Example: Common Number and Variable

➢ **Factorize $6x + 9x^2$.**

Solution: Common factor = 3x

$6x + 9x^2 = 3x(2 + 3x)$

Example: Common Variable Only

➢ **Factorize $a^2b + ab^2$.**

Solution: Common factor = ab

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

Example: Common Numerical Factor Only

➢ **Factorize 14p + 21q.**

Solution: Common factor = 7

14p + 21q = 7(2p + 3q)

Example: Factorizing Three Terms

➢ **Factorize $5xy – 10x^2y^2 + 15xy^2$.**

Solution: Common factor = 5xy

5xy(1 – 2xy + 3y)

Example: Common Factor with Negative Terms

➢ **Factorize $–8m^2 + 12m^3$.**

Solution: Common factor = $–4m^2$

$–8m^2 + 12m^3 = –4m^2(2 – 3m)$

Summary Points

- Always look for the highest common factor in all terms.
- Take out the common monomial and write the remaining expression inside brackets.
- Check your work by expanding back.
- Factoring out simplifies solving equations.
- Factorization makes expressions easier to handle for further operations.