Factorization When a Binomials is Common

Understanding of Factorization When a Binomial is Common

- Sometimes two or more terms in an expression have a common binomial factor.
- We treat the entire binomial as a single factor and take it out just like a monomial factor.
- After taking out the common binomial, the expression inside the bracket becomes simpler.

Important Points

- Identify the common binomial expression in each term.
- Factor out the complete binomial, not just part of it.
- Write the remaining parts of each term inside a new bracket.
- Always expand and verify to check if factorization is correct.
- Grouping terms may help if the binomial is not directly visible.

Examples with Solutions

Example: Simple Common Binomial

➢ **Factorize (x + y)p + (x + y)q.**

Solution: Common binomial = (x + y)

(x + y) (p + q)

Example: Binomial Common after Rearranging

➢ **Factorize 3a(m + n) + 5b(m + n).**

Solution: Common binomial = (m + n)

(m + n) (3a + 5b)

Example: Binomial with Negative Terms

➢ **Factorize (a + b) – 2x(a + b).**

Solution: Common binomial = (a + b)

(a + b) (1 – 2x)

Example: Complex Common Binomial

➢ **Factorize p(x + y) – q(x + y).**

Solution: Common binomial = (x + y)

(x + y) (p – q)

Example: Binomial Grouped in Three Terms

➢ **Factorize (m + n)a + (m + n)b + (m + n)c.**

Solution: Common binomial = (m + n)

(m + n) (a + b + c)

Summary Points

- When the same binomial appears in multiple terms, factor it out.
- Treat the entire binomial like a single factor.
- After factoring, simplify the remaining expression if possible.
- Always double–check by expanding and verifying.
- Binomial factorization helps in solving and simplifying bigger expressions.