



Common Factors and Greatest Common Factors of Monomials

Understanding of Common Factors and Greatest Common Factors of Monomials

- Monomials are algebraic expressions with only one term.
- A common factor is a factor that divides each of the given monomials exactly.
- The greatest common factor (GCF) is the highest factor that divides all the given monomials.
- To find the GCF, separately find the GCF of coefficients (numbers) and variables.

Important Points

- For coefficients, find the highest number that divides all given numbers.
- For variables, take the lowest power of each common variable.
- GCF is the product of the numerical GCF and the common variables.
- GCF is useful in simplifying expressions and factorization.
- Always check that the GCF divides each monomial exactly.

Examples with Solutions

Example: GCF of Simple Monomials

➤ Find the GCF of $8x$ and $12x^2$.

Solution: GCF of 8 and 12 = 4

GCF of x and x^2 = x

GCF = $4x$

Example: GCF with Different Variables

➤ Find the GCF of $6xy$ and $9x^2y^2$.

Solution: GCF of 6 and 9 = 3

GCF of x and x^2 = x

GCF of y and y^2 = y

GCF = $3xy$



Example: GCF of Three Monomials

➤ Find the GCF of $15a^2b$, $10ab^2$, and $20ab$.

Solution: GCF of 15, 10, and 20 = 5

GCF of a^2 , a , and $a = a$

GCF of b , b^2 , and $b = b$

GCF = $5ab$

Example: GCF with No Common Variable

➤ Find the GCF of $18x$ and $24y$.

Solution: GCF of 18 and 24 = 6

No common variable

GCF = 6

Example: GCF Involving Negative Numbers

➤ Find the GCF of $-14p^2q$ and $21pq^2$.

Solution: GCF of 14 and 21 = 7

GCF of p^2 and $p = p$

GCF of q and $q^2 = q$

GCF = $7pq$

Summary Points

- Common factor divides all given monomials exactly.
- Greatest common factor is found by taking GCF of numbers and lowest power of each common variable.
- Always simplify each monomial by the GCF.
- GCF helps to factorize expressions easily.
- Always include variables common to all terms in the GCF.