

FACTORING USING LEAST POWERS

When asked to factor: $12x^4y^2 + 14x^6y^3$

The first thing we ask ourselves is what factors do the terms have in common?
We can figure this out by using prime factorization if needed.

Now, with the factors that the terms have in common, we look for
The **GREATEST COMMON FACTOR**.

The **Greatest Common Factor** is the largest number that divides evenly into all
terms of the polynomial.

To find the GCF:

- Use **EVERY** factor the terms have in common.
- Use the **SMALLEST POWER** of each of those factors.
- The **product of these factors is the GCF**.

Finally, to factor the polynomial, write the GCF in first, then divide
each term in the polynomial by the GCF. Finally write the result.
It should look like: GCF (the remainder of each term)

Examples:

1)

$$5x^5y^3z^2 + x^3y^8z^3$$

2)

$$(3x+2)^{-2} - (3x+2)^{-1}$$

$$3) \quad (4x-1)^{\frac{1}{2}} - \frac{1}{3}(4x-1)^{\frac{3}{2}}$$

$$4) \quad (x^2 + 3)^{-\frac{2}{3}} + (x^2 + 3)^{-\frac{5}{3}}$$

$$5) \quad 21x^{\frac{1}{4}} - 14x^{\frac{3}{4}}$$

6) $5(x^6 + 1)^4 (6x^5)(3x + 2)^3 + 3(3x + 2)^2 (3)(x^6 + 1)^5$