

Factor Using Grouping

1. Factor out all common factors, if there are any.
2. Rearrange terms, if necessary, to factor.
3. Group the expression into two separate parts.
4. Factor out the common factors in each group.
5. What is in each parentheses should be the same, and is now one of the factors. The other factor is what is in front of each parentheses, combined to make a binomial.

Example 1: $10ab - 6b + 35a - 21$

$$\begin{aligned}(10ab - 6b) + (35a - 21) & \text{Step 3} \\ 2b(5a - 3) + 7(5a - 3) & \text{Step 4} \\ (5a - 3)(2b + 7) & \text{Step 5 Answer}\end{aligned}$$

Example 2: $15 - 5m^2 - 3r^2 + m^2r^2$

$$\begin{aligned}(15 - 5m^2) + (-3r^2 + m^2r^2) & \text{Step 3} \\ 5(3 - m^2) + -r^2(3 - m^2) & \text{Step 4} \\ (3 - m^2)(5 - r^2) & \text{Step 5 Answer}\end{aligned}$$

Example 3: $20z^2 - 8x + 5pz^2 - 2px$

$$\begin{aligned}(20z^2 - 8x) + (5pz^2 - 2px) & \text{Step 3} \\ 4(5z^2 - 2x) + p(5z^2 - 2x) & \text{Step 4} \\ (5x^2 - 2x)(4 + p) & \text{Step 5 Answer}\end{aligned}$$

Example 4: $p^2q^2 - 10 - 2q^2 + 5p^2$

$$\begin{aligned}p^2q^2 + 5p^2 - 2q^2 - 10 & \text{Step 2} \\ (p^2q^2 + 5p^2) + (-2q^2 - 10) & \text{Step 3} \\ p^2(q^2 + 5) + -2(q^2 + 5) & \text{Step 4} \\ (q^2 + 5)(p^2 - 2) & \text{Step 5 Answer}\end{aligned}$$



M-F1