

Factoring by Grouping

Example: $2x^3 - 3x^2 - 8x + 12$

$(2x^3 - 3x^2) + (-8x + 12)$ ← *Group terms that have a common factor.*

$x^2(2x - 3) - 4(2x - 3)$ ← *Factor the GCF out of each group.*

$(2x - 3)(x^2 - 4)$ ← *Factor out the common factor $(2x - 3)$.*

$(2x - 3)(x - 2)(x + 2)$ ← *Factor the difference of two perfect squares.*

1. Factoring by Grouping

Factor completely.

(a) $2x(x - 6) + 5(x - 6)$

(b) $(x^3 - 5x^2) + (3x - 15)$

(c) $6x^3 - 3x^2 + 8x - 4$

(d) $4x^5 - 12x^4 - 16x^3 + 48x^2$

Additional Problems

Factor.

2. $2x(x - 3) - 5(x - 3)$

3. $x^2(4x + 1) + 3(4x + 1)$

4. $x^3 - 3x^2 + 3x - 9$

5. $x^3 - 3x^2 - 3x + 9$

6. $x^3 - x^2 + 2x - 2$

7. $x^3 - 4x^2 - 3x + 12$

8. $2x^3 + 8x^2 + 2x + 8$

9. $5y^2 + 15y - 2y - 6$

10. $x^3 + x^2 + 2x + 2$

11. $c^3 + 7c^2 + 5c + 35$

12. $5n^3 - 4n^2 + 25n - 20$

13. $y^3 - 9y^2 + y - 9$

14. $a^3 + 13a^2 - 5a - 65$

15. $x^2 + 8x - xy - 8y$

16. $z^3 - 4z^2 + 3z - 12$

17. $2s^3 - 3s^2 + 18s - 27$

18. $y^2 + y + 5xy + 5x$

19. $x^4 - 4x^3 - x + 4$