

Common Factoring

We can expand (or multiply) polynomials by applying the distributive property:

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

We can factor (or unexpand) a polynomial by reversing this process (ie., by “finding the instructions” instead of “following the instructions”).

In the current unit we will factor simple polynomials quickly using patterns.

In the next unit we will “factor” difficult polynomials using mathematical processes.

Factoring a polynomial means writing it as a product of two or more polynomials.
(ie., two or more factors)

Common factoring a polynomial means removing the same factor from every term.

Steps for Common Factoring a Polynomial

1. Determine the greatest common factor of all the terms in the polynomial.

This may be a number or a variable or both.

It is usually monomial but sometimes it is a polynomial expression.

2. Write the greatest common factor as the first factor (in brackets).
3. Divide each term of the polynomial by the greatest common factor and write the result as the second factor (in brackets).

Example - Factor each of the following expressions.

1. $2y + 8$

2. $5x - 25y$

3. $6x + 18y$

4. $60y + 56x^2$

5. $18y^2 - 54y$

6. $66xy + 55x^2y$

7. $12y - 24y^2$

8. $30y^3 + 20y^2$

9. $9y^2 - 3y + 6$

10. $-25x^3 - 40x^2 + 35x$

11. $80x^3 - 30x^2y$

12. $12x + 18y - 4z$

13. $36xy^3 + 24y^2$

14. $105x - 30xy + 75xz$

15. $40a^2b^3 + 20a^3b^2 - 10ab^4$

16. $100xyz + 200xyz - 600xyz$

$$17. \quad 3(x+2) - 5(x+2)$$

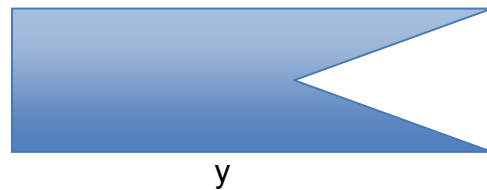
$$18. \quad 4x(2x-3y) + 5(2x-3y)$$

$$19. \quad 4x^2(3a+b) - 6x(3a+b)$$

$$20. \quad 7a(x-y) + 14b(x-y) + 21(x-y)$$

Example - Find a polynomial expression, in simplified form, for the shaded area of the shape below. Then, factor the expression.
The height of the triangle is z .

$6x$



Homework: 1. Complete questions #3, 4, 5, and 13a on page 234.
2. Complete the worksheet below.

Homework worksheet: Common Factoring (removing the greatest common factor)

Factor each expression (each final answer should show the GCF).

1. $8x + 20$

2. $12x - 30$

3. $-6x - 24$

4. $45 - 18x$

5. $4x^2 + 32$

6. $12x^2 - 30$

7. $-3x^2 + 15$

8. $35 - 10x^2$

9. $x^2 - 6x$

10. $4x^2 + 12x$

11. $-6x^2 - 21x$

12. $20 - 8x^2$

13. $6x^2 - 15x + 24$

14. $8x^2 - 20x + 30$

15. $-4x^2 + 12x - 28$

16. $-0.5x^2 - 3.5x - 9$

17. $-4x^3 + 10x^2 - 12$

18. $3x^2y - 15xy + 12xy^2$