Worksheet 4-6: Adding and Subtracting Polynomials

Simplest Form of Polynomials:
A polynomial or an algebraic expression is in its simplest form when there are **no like terms.**

So, we need to collect like terms to simplify polynomials.

Steps for Collecting Like Terms

Step 1: Group like terms together
Step 2: Add or Subtract the coefficients of the like terms

** Pay special attention to " –" sign: you need to change the sign(s) when distributing the bracket.

1. **Simplifying Monomials**

(a) $-2x + 3y + 4x + 5y$ (b) $4x - 6x^2 + 5x - 9x^2$

2. **Simplifying Binomials** (*Distribute the sign before the brackets by multiplying it into the brackets.*)

(a) $(4y + 1) + (8y - 3)$ (b) $(7x - 1) + (1 - 10x)$

(c) $(8x^2 - 4) - (3x^2 + 1)$ (d) $(9y + 3) - (8 - 23y)$
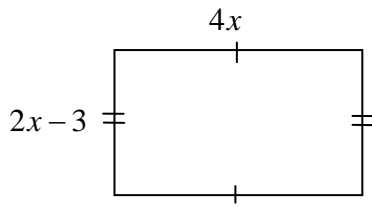
3. **Simplifying Trinomials**

(a) $(2x^2 + 3x + 1) + (x^2 - 2x - 3)$ (b) $(4x - 5y + 7) - (3x + 2y - 5)$
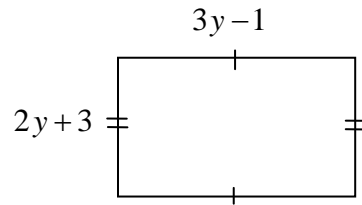
Polynomial Challenge:

4. Write a polynomial for the perimeter of each figure. *A polynomial is always in its simplest form with no brackets, no like terms, or no two signs next to one another.*
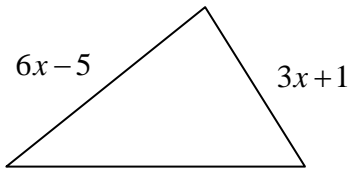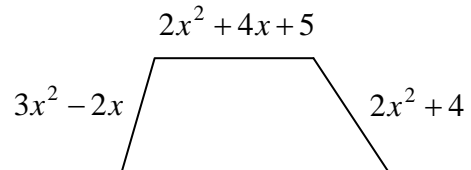
(a)

4x

2x − 3

(b)

3y − 1

2y + 3

5. Given the perimeter, P, find the missing side length of each figure.

(a) $P = 15x + 7$

6x − 5

3x + 1

(b) $P = 11x^2 + 6x + 9$

$2x^2 + 4x + 5$

$3x^2 - 2x$

$2x^2 + 4$

6. Expand and simplify.

(a) $4(2x - 7) - 5(4x + 9)$

(b) $3(y^2 - y - 1) + 2(-3y^2 + 5y - 6)$

Answers: **1.** (a) $2x + 8y$, (b) $9x - 15x^2$; **2.** (a) $12y - 2$, (b) $-3x$, (c) $5x^2 - 5$, (d) $-14y - 5$;

3. $3x^2 + x - 2$, (d) $x - 7y + 12$; **4.** (a) $12x - 6$, (b) $10y + 4$;

5. (a) $6x + 3$, (b) $4x^2 + 4x$; **6.** (a) $-12x - 73$, (b) $-3y^2 + 7y - 15$

Bingo: Adding and Subtracting Polynomials

Instructions:
(1) Write numbers 1-9 randomly in the small boxes inside the big squares.
(2)   According to each question number, copy the question inside the big square.
(3) Solve each question inside each big square. **Show your steps**.

1. $(x + 4) + (3x - 7)$

2. $(3x^2 - 5x + 7) + (2x^2 - x - 11)$

3. $(4x + 7y) - (6x + y)$

4. $(6y^2 - 2y) - (5y^2 + 3y + 8)$

5. $(7y^2 + 4y - 11) - (2y^2 + 3y + 8)$

6. $5(2x + 3) + 3(x - 4)$

7. $4(x^2 - 5x) - 2(3x^2 + 4x)$

8. $7(x^2 - 4x + 5) - 3(4x^2 + 3x - 9)$

9. $2(5x + 7y) - 4(-x - 5y)$