

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) $-2x + 3y + 4x + 5y$
 $2x + 8y$

(b) $4x - 6x^2 + 5x - 9x^2$
 $-15x^2 + 9x$

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

(a) $(4y + 1) + (8y - 3)$
 $12y - 2$

(b) $(7x - 1) + (1 - 10x)$
 $-3x$

(c) $(8x^2 - 4) - (3x^2 + 1)$
 $8x^2 - 4 - 3x^2 - 3$
 $5x^2 - 7$

(d) $(9y + 3) - (8 - 23y)$
 $9y + 3 - 8 + 23y$
 $32y - 5$

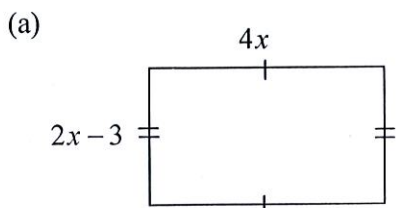
3. Simplifying Trinomials

(a) $(2x^2 + 3x + 1) + (x^2 - 2x - 3)$
 $2x^2 + 3x + 1 + x^2 - 2x - 3$
 $3x^2 + x - 2$

(b) $(4x - 5y + 7) - (3x + 2y - 5)$
 $4x - 5y + 7 - 3x - 2y + 5$
 $x - 7y + 12$

Polynomial Challenge:

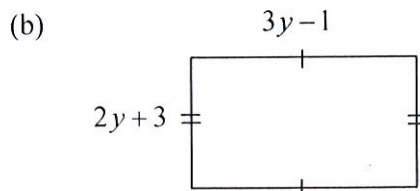
4. Write a polynomial for the perimeter of each figure. *A polynomial is always in its simplest form with no brackets, no like terms, or no two signs next to one another.*



$$2(2x-3) + 2(4x)$$

$$4x - 6 + 8x$$

$$12x - 6$$



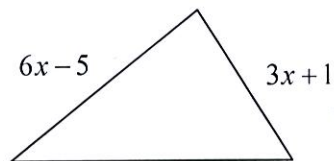
$$2(2y+3) + 2(3y-1)$$

$$4y + 6 + 6y - 2$$

$$10y + 4$$

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

(a) $P = 15x + 7$



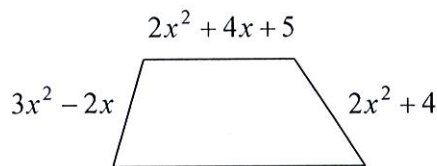
$$15x + 7 = 6x - 5 + 3x + 1 + y$$

$$15x + 7 = 9x - 4 + y$$

$$-9x + 4 \quad -9x + 4 \quad -10x + 7$$

$$6x + 11 = y$$

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



$$11x^2 + 6x + 9 = 3x^2 - 2x + 2x^2 + 4x + 5 + y$$

$$11x^2 + 6x + 9 = 7x^2 + 2x + 9 + y$$

$$-7x^2 - 2x - 9 = -7x^2 - 2x - 9 + y$$

$$4x^2 + 4x = y$$

6. Expand and simplify.

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

$$8x - 28 - 20x - 45$$

$$-12x - 73$$

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

$$3y^2 - 3y - 3 - 6y^2 + 10y - 12$$

$$-3y^2 + 7y - 15$$