Terms, Like Terms, Coefficients, and Constants:

When we look at the expression, \(4x + 3 - 2x - 7\), we must learn to identify certain vocabulary words that pertain to it.

The terms are the number of parts in the expression. In this particular expression, \((4x), (3), (-2x),\) and \((-7)\) are all terms. Because of this, there are four terms in the expression.

Consider the following expressions. How many terms are in it?

\[
a) \quad 8x^2 + 5x - 2 + 6 - 4x \quad \text{(5 terms)} \\
b) \quad 8x^2 - 2x - 2 + 6xy \quad \text{(4 terms)}
\]

The like terms are the terms that can be put together. \((9x)\) and \((3x)\) are like terms because they both have the same variable and the same degree (they both have x). \((-5)\) and \((3)\) are like terms because they are both constants.

Consider the following expressions. What are the like terms?

\[
a) \quad 3x^2 + 7x - 2 - 4x \quad \text{only 7x and -4x are like terms (they both have x to the first power)} \\
b) \quad 3x^2y + 7xy - 2x^2y - 4x + 5xy - 3, \quad 3x^2y \text{ and } -2x^2y \text{ are like terms, } 7xy \text{ and } 5xy \text{ are like terms (same variables, same degree)}
\]
The **coefficients** are the numbers that multiply the variables. In the term \((5x)\), the number \((5)\) is a **coefficient** because it represents 5 times \(x\). In the term \((-3x^2y)\), the number \((-3)\) is a **coefficient** because it is attached to \(x^2y\).

Consider the following expression. What are the coefficients in the expression

\[
4x^2 + 5x - 3
\]

the coefficients are: 4 (for quadratic term), 5 (for linear term)

The **constants** are the numbers that are NOT attached to anything. In the expression, \(3x + 2\), \((2)\) is a constant because it is not attached to anything. The \((3)\) is not a constant because it is attached to \(x\), and it is actually a coefficient.

Consider the following expressions. What are the constants in the expressions?

a) \(4x^2 + 5x - 3\)  
   -3 is the constant  
b) \(5x^4 - 3x^2 - 3x\)  
   there is no constant in this expression

**Simplest Form and Combining Terms**

An expression is in simplest form when no like terms are found in it. Consider the two expressions:

\[
8x^2 - 5x + 6 \quad 9x^2 + 2 - 3x - 8
\]

The first **IS in simplest form**, but the second is **NOT in simplest form** (because +2 and -8 are like terms). Be sure to work on telling the difference.
Vocabulary Notes:

Terms: The parts of an expression

Like Terms: Terms that can be put together

Coefficients: Numbers that multiply variables

Constants: Numbers attached to nothing
Review Work 1

8. What are the like terms of the expression \(8x - 4y + 2 - 3x - 5x?\)

9. What are the coefficients of the expression \(2x^2 + 5x - 3 - 8x\)

10. What are the constants of the expression \(5x - 6y + 2 - 8x - 3\)

11. Simplify the expression \(2x + 7x + 8\)

12. Simplify the expression \(3(2x + 7)\)

13. Simplify the expression \(-(2x - 5y - 4)\)

14. Simplify the expression \(13m - (4m + 5)\)

15. Simplify the expression \(\frac{4x - 8}{2}\)

1. Translate the verbal expression “5 more than a number.”

2. Translate the verbal expression “9 less than a number.”

3. Translate the verbal expression “2 less a number.”

4. Translate the verbal expression “the sum of 4 times a number and 7.”

5. Translate the verbal expression “6 times the sum of x and 8.”

6. Evaluate \(\sqrt{\frac{25}{36}}\)

7. How many terms are in the expression \(9x^2 + 3y - 4x^2 + 6x + 7?\)
16. Which computation would you use to solve the problem \(-6 + 3\)?
   a. \(6 + 3\)
   b. \(6 - 3\)

17. Which computation would you use to solve the problem \(-18 + (-14)\)?
   a. \(18 + 14\)
   b. \(18 - 14\)

18. Which computation would you use to solve the problem \(9 - 15\)?
   a. \(15 + 9\)
   b. \(15 - 9\)

19. Which computation would you use to solve the problem \(6 - (-5)\)?
   a. \(6 - 5\)
   b. \(6 + 5\)

20. Which computation would you use to solve the problem \(-9 - 4\)?
   a. \(9 + 4\)
   b. \(9 - 4\)