Lesson 1.3 & Lesson 1.4 Warm Up (Clickers)

1. Which property is being illustrated below?

$(3 + f) + 9 = 3 + (f + 9)$

2. What number system does the following belong to (name all that apply)?

a. 1.345 b. -3 c. $\sqrt{9}$

3. Solve the equation:

$3x - 9 = 12x + 4$

Lesson 1.3 Algebraic Expressions & Lesson 1.4 Solving Equations

Essential Understanding: You can represent some mathematical phrases and real-world quantities using algebraic expressions.

Ex. Which algebraic expression models the word phrase seven fewer than a number t?

a. $t + 7$ b. $-7t$ c. $t - 7$ d. $7 - t$

1 Which algebraic expression models the word phrase two times the sum of a and b?

A $a + b$

B $2(a + b)$

C $2a + b$

D $a + 2b$

Ex. You start with $20 and save $6 each week. Write an algebraic expression that models the total amount you save.

2 You had $150, but you are spending $2 each day. What algebraic expression models this situation?

To evaluate an algebraic expression, substitute a number for each variable in the expression. Then simplify using the order of operations.

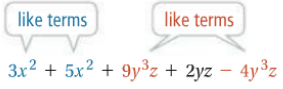
Ex. Evaluate 7(a + 4) + 3b - 8 for a = -4 and b= 5

3 Evaluate for x = 1 and y = 1/2 (put your answer in as a fraction)

$$\frac{x}{2} + y^2$$

An expression that is a number, a variable, or the product of a number and one or more variables is a term. A coefficient is the numerical factor of a term. A constant term is a term with no variables.

Like terms have the same variables raised to the same powers. You can simplify an algebraic expression that has like terms.



Ex. Simplify

a. $7x^2 + 3y^2 + 2y^2 - 4x^2$

b. $-(3k + m) + 2(k - 4m)$

4 Simplify: -(8a + 3b) + 10(2a - 5b)

Lesson 1.4 Essential Understanding: You can use the properties of equality and inverse operations to solve equations.

Ex. Solve -27 + 6y = 3(y - 3)

Take Note

Properties Properties of Equality

Assume a, b, and c represent real numbers.

Property	Definition	Example
Reflexive	$a = a$	$5 = 5$
Symmetric	If $a = b$, then $b = a$.	If $\frac{1}{2} = 0.5$, then $0.5 = \frac{1}{2}$.
Transitive	If $a = b$ and $b = c$, then $a = c$.	If $2.5 = 2\frac{1}{2}$ and $2\frac{1}{2} = \frac{5}{2}$, then $2.5 = \frac{5}{2}$.
Substitution	If $a = b$, then you can replace a with b and vice versa.	If $a = b$ and $9 + a = 15$, then $9 + b = 15$.
Addition	If $a = b$, then $a + c = b + c$.	If $x = 12$, then $x + 3 = 12 + 3$.
Subtraction	If $a = b$, then $a - c = b - c$.	If $x = 12$, then $x - 3 = 12 - 3$.
Multiplication	If $a = b$, then $a \cdot c = b \cdot c$.	If $x = 12$, then $x \cdot 3 = 12 \cdot 3$.
Division	If $a = b$, then $a \div c = b \div c$ (with $c \neq 0$).	If $x = 12$, then $x \div 3 = 12 \div 3$.

5 Solve: $6x - 3 - 2(3x + 4) = 11x$

Ex. Flower carpets incorporate hundreds of thousands of brightly-colored flowers as well as grass, tree bark, and sometimes fountains to form intricate designs and motifs. The flower carpet below, from Grand Place in Brussels, Belgium, has a perimeter of 200 meters. What are the dimensions of the flower carpet?

6 Solve: $4 + 3x = 6x + 5 - 3x$

7 Solve: $6x + 5 - 2x = 4 + 4x + 1$

A literal equation is an equation that uses at least two different letters as variables. You can then solve for any of the variables in the equation.

Ex. The equation $C = \frac{5}{9}(F - 32)$ relates temperatures in degrees Fahrenheit F and degrees Celsius C. What is F in terms of C?

8 The equation K = C + 273 relates temperatures kelvins K and degrees Celsius C. What is C in terms of K?