Vocabulary

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Use the vocabulary words and definitions below as a reference for this unit.

additive inverses ..... a number and its opposite whose sum is zero (0); also called *opposites*
Example: In the equation 3 + (-3) = 0, the additive inverses are 3 and -3.

base (of an exponent) (algebraic) ..... the number used as a factor in exponential form
Example: 2^3 is the exponential form of 2 x 2 x 2. The numeral two (2) is called the base, and the numeral three (3) is called the exponent.

binomial ..... the sum of two monomials; a polynomial with exactly *two* terms
Examples: $4x^2 + x$ $2a - 3b$ $8qrs + qr^2$

canceling ..... dividing a numerator and a denominator by a common factor to write a fraction in lowest terms or before multiplying fractions
Example: $\frac{15}{24} = \frac{{}^{1}\cancel{3} \bullet 5}{2 \bullet 2 \bullet 2 \bullet \cancel{3}_{1}} = \frac{5}{8}$

coefficient ..... the number that multiplies the variable(s) in an algebraic expression
Example: In $4xy$, the coefficient of xy is 4.
If no number is specified, the coefficient is 1.

common factor ..... a number that is a factor of two or more numbers
Example: 2 is a common factor of 6 and 12.

Vocabulary

commutative property ..... the order in which two numbers are added or multiplied does *not* change their sum or product, respectively
Examples: $2 + 3 = 3 + 2$ *or*
$4 \times 7 = 7 \times 4$

composite number ..... a whole number that has more than two factors
Example: 16 has five factors—1, 2, 4, 8, and 16.

counting numbers
(natural numbers) ..... the numbers in the set {1, 2, 3, 4, 5, …}

denominator ..... the bottom number of a fraction, indicating the number of equal parts a whole was divided into
Example: In the fraction $\frac{2}{3}$ the denominator is 3, meaning the whole was divided into 3 equal parts.

distributive property ..... the product of a number and the sum or difference of two numbers is equal to the sum or difference of the two products
Examples: $x(a + b) = ax + bx$
$5(10 + 8) = 5 \bullet 10 + 5 \bullet 8$

exponent
(exponential form) ..... the number of times the base occurs as a factor
Example: 2^3 is the exponential form of $2 \times 2 \times 2$. The numeral two (2) is called the *base*, and the numeral three (3) is called the *exponent*.

Vocabulary

expression ..... a mathematical phrase or part of a number sentence that combines numbers, operation signs, and sometimes variables
Examples: $4r^2$; $3x + 2y$; $\sqrt{25}$
An expression does *not* contain equal (=) or inequality (<, >, ≤, ≥, or ≠) signs.

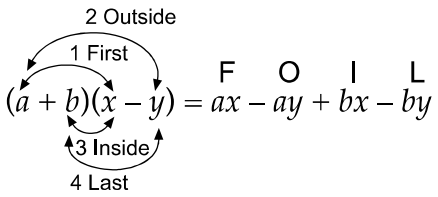
factor ..... a number or expression that divides evenly into another number; one of the numbers multiplied to get a product
Examples: 1, 2, 4, 5, 10, and 20 are factors of 20 and $(x + 1)$ is one of the factors of $(x^2 - 1)$.

factored form ..... a number or expression expressed as the product of prime numbers and variables, where no variable has an exponent greater than 1

FOIL method ..... a pattern used to multiply two binomials; multiply the first, outside, inside, and last terms:

F **F**irst terms
O **O**utside terms
I **I**nside terms
L **L**ast terms.

Example:



fraction ..... any part of a whole
Example: One-half written in fractional form is $\frac{1}{2}$.

Vocabulary

greatest common factor (GCF)..... the largest of the common factors of two or more numbers
Example: For 6 and 8, 2 is the greatest common factor.

grouping symbols ..... parentheses ( ), braces { }, brackets [ ], and fraction bars indicating grouping of terms in an expression

integers ..... the numbers in the set
{… , -4, -3, -2, -1, 0, 1, 2, 3, 4, …}

like terms ..... polynomials with exactly the same variable combinations; terms that have the same variables and the same corresponding exponents
Example: In $5x^2 + 3x^2 + 6$, the like terms with the same variable combinations are $5x^2$ and $3x^2$.

monomial ..... a number, variable, or the product of a number and one or more variables; a polynomial with only *one* term
Examples: 8 x $4c$ $2y^2$ -3 $\frac{xyz^2}{9}$

natural numbers (counting numbers) ..... the numbers in the set {1, 2, 3, 4, 5, …}

numerator ..... the top number of a fraction, indicating the number of equal parts being considered
Example: In the fraction $\frac{2}{3}$, the numerator is 2.

Vocabulary

opposites ..... two numbers whose sum is zero; also called *additive inverses*
Examples: $-5 + 5 = 0$ *or* $\frac{2}{3} + \left(-\frac{2}{3}\right) = 0$
(opposites) (opposites)

order of operations ..... the order of performing computations in parentheses first, then exponents or powers, followed by multiplication and/or division (as read from left to right), then addition and/or subtraction (as read from left to right); also called *algebraic order of operations*
Example: $5 + (12 - 2) \div 2 - 3 \times 2 =$
$5 + 10 \div 2 - 3 \times 2 =$
$5 + 5 - 6 =$
$10 - 6 =$
4

polynomial ..... a monomial or sum of monomials; any rational expression with no variable in the denominator
Examples: $x^3 + 4x^2 - x + 8$ $5mp^2$
$-7x^2y^2 + 2x^2 + 3$

power (of a number) ..... an exponent; the number that tells how many times a number is used as a factor
Example: In 2^3, 3 is the power.

prime factorization ..... writing a number as the product of prime numbers
Example: $24 = 2 \times 2 \times 2 \times 3 = 2^3 \times 3$

prime number ..... any whole number with only two whole number factors, 1 and itself
Examples: 2, 3, 5, 7, 11, etc.

Vocabulary

product ..... the result of multiplying numbers together
Example: In 6 x 8 = 48, the product is 48.

quotient ..... the result of dividing two numbers
Example: In 42 ÷ 7 = 6, the quotient is 6.

rational expression ..... a fraction whose numerator and/or denominator are polynomials
Examples: $\frac{x}{8}$ $\frac{5}{x+2}$ $\frac{4x^2+1}{x^2+1}$

simplest form (of an expression) ..... an expression that contains no grouping symbols (except for a fraction bar) and all like terms have been combined
Examples: $6 + y + 3z + 4z = 6 + y + 7z$
$\frac{6xy^2}{5} + \frac{7xy^2}{5} = \frac{13xy^2}{5}$

standard form (of a quadratic equation) ..... $ax^2 + bx + c = 0$, where a, b, and c are integers (not multiples of each other) and $a > 0$

sum ..... the result of adding numbers together
Example: In 6 + 8 = 14, the sum is 14.

term ..... a number, variable, product, or quotient in an expression
Examples: In the expression $4x^2 + 3x + x$, the terms are $4x^2$, $3x$, and x.

trinomial ..... the sum of three monomials; a polynomial with exactly *three* terms
Examples: $x + y + 2$ $m^2 + 6m + 3$
$b^2 - 2bc - c^2$ $8j^2 - 2n + rp^3$

Vocabulary

variable ..... any symbol, usually a letter, which could represent a number

whole numbers ..... the numbers in the set {0, 1, 2, 3, 4, …}

zero property of multiplication or

zero product property ..... for all numbers a and b, if $ab = 0$, then $a = 0$ and/or $b = 0$