

Completed
notes

Algebra 2

Chapter 1

Section 1.1

Expressions and Formulas

Algebra 2

Friday 9/5/14

- Discuss sections 1.1 and 1.2
- Review and discuss Section 1.3
- Assignments: 1.10 and 1.30, due Mon 9/8
 - A#1.10 pages 49-50 [#11-~~27~~] 25
 - A#1.30 pg 51 [#28-39]

Review of Key Vocabulary

- **Variables:** Symbols (letters) used to represent unknown quantities.
- **Algebraic Expressions:** Expressions that contain at least one variable.
- **Monomial:** An algebraic expression that is a number, variable, or product of a number and one or more variables.
- **Constants:** Monomials that contain no variables.
- **Coefficient:** The numerical factor of a monomial.

Review of Key Vocabulary

- **Degree:** (of a monomial) is the sum of the exponents of its variables.
- **Power:** An expression in the form of x^n . The word is also used to refer to the exponent itself.
- **Polynomial:** A monomial or a sum of monomials.
- **Terms:** (of a polynomial) the monomials that make up a polynomial.
- **Like Terms:** Monomials that can be combined. They have the same variables *to the same powers*.

Review of Key Vocabulary

- **Trinomial:** A polynomial that has three unlike terms.
- **Binomial:** A polynomial that has two unlike terms.
- **Formula:** A mathematical sentence that expresses the relationship between certain quantities.

REMEMBER: ORDER OF OPERATIONS

PLEASE EXCUSE MY
DEAR AUNT SALLY

Please = Parentheses

Excuse = Exponents

My Dear = Multiplication and/or Division

Aunt Sally = Addition and/or Subtraction



Practice Problems – Evaluating Expressions

Evaluate each expression if $x = 4$, $y = -2$, and $z = 3.5$.

1. $z - x + y$

$$= 3.5 - 4 + (-2)$$

$$= -0.5 - 2$$

$$= \boxed{-2.5}$$

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

$$x + 3y - 3$$

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

$$= 4 - 6 - 3$$

$$= -2 - 3$$

$$= \boxed{-5}$$

3. $x + [3(y + z) - y]$

$$x + [3y + 3z - y]$$

$$= 4 + [3(-2) + 3(3.5) - (-2)]$$

$$= 4 + [-6 + 10.5 + 2]$$

$$= 4 + [6.5]$$

$$= \boxed{10.5}$$

4. $\frac{x^2 - y}{z + 2.5}$

$$4. \frac{(4)^2 - (-2)}{3.5 + 2.5} = \frac{16 + 2}{6} = \frac{18}{6} = \boxed{3}$$

Practice Problems – Using Formulas

Simple interest is calculated using the formula $I = prt$, where p represents the principal in dollars, r represents the annual interest rate, and t represents the time in years. Find the simple interest I given in each set of values.

1. $p = \$1,800$, $r = 6\%$, $t = 4$ years

$$\begin{aligned} I &= prt \\ &= 1800(0.06)(4) \\ &= \$432 \end{aligned}$$

2. $p = \$31,000$, $r = 2\frac{1}{2}\%$, $t = 18$ months

$$\begin{aligned} I &= 31,000(0.025)(1.5) \\ &= \$1162.50 \end{aligned}$$

$$18 \text{ mo} = 1.5 \text{ yr}$$

Section 1.2

Properties of Real Numbers

Real Number System

RATIONAL: written in form a/b i.e. fractions and repeating decimals.

INTEGER: whole numbers and their additive inverses.
...-3,-2,-1,0,1,2,3...

WHOLE: 0,1,2,3...

NATURAL (counting):
1,2,3...

REAL: Includes all rational and irrational numbers.

IRRATIONAL: non-terminating, non-repeating numbers, i.e.
 $\pi = 3.14159...$

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Real Numbers

<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">Rational Numbers</p> <p style="text-align: center;">..., $\frac{1}{8}, \frac{1}{4}, \frac{1}{3}, \frac{3}{8}, \frac{1}{2}, \frac{5}{8}, \frac{2}{3}, \frac{3}{4}, \frac{7}{8}, ...$</p> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">Integers</p> <p style="text-align: center;">..., -7, -6, -5, -4, -3, -2, -1, ...</p> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">Whole Numbers</p> <p style="text-align: center;">0</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">Natural Numbers</p> <p style="text-align: center;">1, 2, 3, 4, 5, 6, 7, 8, 9, ...</p> </div>	<p style="text-align: center;">Irrational Numbers</p> <p style="text-align: center;">π</p> <p style="text-align: center;">$(2)^{\frac{1}{2}} = \sqrt{2}$</p> <p style="text-align: center;">etc.</p>
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R = Reals

I = Irrationals

W = Wholes

Q = Rationals

Z = Integers

N = Naturals

Practice – Sets of Numbers

- Name the sets of numbers to which each number belongs:

5	$\sqrt{6}$	$-\frac{2}{3}$	-43	-23.3
R Q Z W, N	H R	Q R	R Q N	Q R

Properties of Real Numbers

Property	Addition	Multiplication
Commutative	$a + b = b + a$	$a * b = b * a$
Associative	$(a + b) + c = a + (b + c)$	$(a * b) * c = a * (b * c)$
Identity	$a + 0 = a = 0 + a$	$a * 1 = a = 1 * a$
Inverse	$a + (-a) = 0 = (-a) + a$	If $a \neq 0$, then $a * \frac{1}{a} = 1 = \frac{1}{a} * a$
Distributive	$a(b + c) = ab + ac$ and $(b + c)a = ba + ca$	

Practice – Properties of Real Numbers

- Name the property illustrated by:

$$(-8 + 8) + 15 = 0 + 15$$

additive inverse

- Identify the additive inverse and multiplicative inverse for -7 .

$$+7$$

$$-\frac{1}{7}$$

Practice – Simplifying Expressions

- Simplify:

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

$$= 12x - 6y - 6x - 2y$$

$$= \boxed{6x - 8y}$$

- Simplify:

$$\frac{1}{2}(16 - 4a) - \frac{3}{4}(12 + 20a)$$

$$8 - 2a - 9 - 15a$$

$$\boxed{-1 - 17a}$$