

# PRE-ALGEBRA

## Unit 1

Topic: \_\_\_\_\_ Name: \_\_\_\_\_

Main Ideas/Questions	Notes/Examples
What are Integers?	
The Number Line	
Writing Integers	Directions: Write an integer for each situation. 1. a 3-yard gain 3. a \$75 deposit 5. 5 miles above sea level

Topic: \_\_\_\_\_ Name: \_\_\_\_\_

Main Ideas/Questions	Notes/Examples
PARTS OF A FRACTION	All numbers that can be written as a fraction are called rational numbers.
SIMPLEST FORM	Directions: Write each fraction in simplest form.

Topic: \_\_\_\_\_ Name: \_\_\_\_\_

Main Ideas/Questions	Notes/Examples
Adding & Subtracting Fractions	<ol style="list-style-type: none"><li>Write all mixed numbers as improper fractions.</li><li>Find a common denominator. (LCD)</li><li>Rewrite the fractions using the LCD as the denominator. Adjust each numerator to reflect the change in denominator.</li><li>Add/Subtract the numerators and keep the common denominator.</li><li>Simplify, if needed.</li></ol>

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Main Ideas/Questions	Notes/Examples
PERFECT SQUARES	The square of an integer is called a perfect square. Generate the first 10 perfect squares: $1^2$ $2^2$ $3^2$ $4^2$ $5^2$ $6^2$
SQUARE ROOTS	<ul style="list-style-type: none"><li>The opposite of squaring a number is finding its square root.</li><li>Positive numbers have two square roots: one positive and one negative.</li></ul> <p>Why? What number(s) can you square to get _____?</p>

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Main Ideas/Questions	Notes/Examples
Evaluating Expressions	<ul style="list-style-type: none"><li>What is an algebraic expression? An expression that contains one or more variables.</li><li>To evaluate: Substitute the given values for the variables and then follow the order of operations.</li></ul>
Examples	Directions: Evaluate each expression using the variable replacements. 1. $7x + 4y$ if $x = 5$ and $y = -3$ 2. $9a^2 - 2b^2$ if $a = 4$ and $b = 7$

Topic: \_\_\_\_\_ Name: \_\_\_\_\_

Main Ideas/Questions	Notes/Examples
Exponents	In the case of repeated multiplication, rewrite the expression using exponents. Parts of an exponential expression: Base: _____ Exponent: _____ Read as: _____
Examples	Directions: Write each expression in expanded notation. 1. $11 \cdot 11$ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____

# THE REAL NUMBERS

NOTES • HOMEWORK • QUIZZES • TEST

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## Unit 1 - The Real Numbers: Sample Unit Outline

	<b>TOPIC</b>	<b>HOMEWORK</b>
<b>DAY 1</b>	Integers, Integer Operations, and Absolute Value	HW #1
<b>DAY 2</b>	Simplifying Fractions, Mixed vs. Improper Forms, Converting Fractions/Decimals/Percents	HW #2
<b>DAY 3</b>	Adding & Subtracting Fractions	HW #3
<b>DAY 4</b>	Multiplying & Dividing Fractions	HW #4
<b>DAY 5</b>	<b>Quiz 1-1</b>	None
<b>DAY 6</b>	Exponents, Zero Exponent, Negative Exponents	HW #5
<b>DAY 7</b>	Perfect Squares, Square Roots, Non-Perfect Squares Perfect Cubes and Cube Roots	HW #6
<b>DAY 8</b>	Scientific Notation, Comparing & Ordering Number Forms	HW #7
<b>DAY 9</b>	<b>Quiz 1-2</b>	None
<b>DAY 10</b>	Order of Operations	HW #8
<b>DAY 11</b>	Evaluating Expressions	HW #9
<b>DAY 12</b>	The Real Number System	HW #10
<b>DAY 13</b>	Properties of Real Numbers	HW #11
<b>DAY 14</b>	<b>Quiz 1-3</b>	None
<b>DAY 15</b>	Unit 1 Review	Study for Test
<b>DAY 16</b>	<b>UNIT 1 TEST</b>	None

See sample images of the pages on the next page.

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Topic: \_\_\_\_\_ Class: \_\_\_\_\_

**Main Ideas/Questions** **Notes/Examples**

**What are integers?**

**The Number Line**

**Writing Integers**

**Directions:** Write an integer for each situation.

- a 3-yard gain
- a \$75 deposit
- 5 miles above sea level

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Topic: \_\_\_\_\_ Class: \_\_\_\_\_

**Main Ideas/Questions** **Notes/Examples**

**PARTS OF A FRACTION**

All numbers that can be written as fractions are rational numbers.

**SIMPLEST FORM**

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Topic: \_\_\_\_\_ Class: \_\_\_\_\_

**Main Ideas/Questions** **Notes/Examples**

**Adding & Subtracting Fractions**

- Write all mixed numbers as improper fractions.
- Find a **common denominator** by identifying the least common denominator. (**LCD**)
- Rewrite the fractions using the LCD as the denominator. Adjust each numerator to reflect the change in denominator.
- Add/Subtract the numerators and keep the same denominator.
- Simplify (if needed).

**Examples**

- $\frac{1}{10} + \frac{3}{10}$
- $\frac{1}{4} + \frac{2}{3}$

Name: \_\_\_\_\_ Pre-Algebra  
 Date: \_\_\_\_\_ Per: \_\_\_\_\_ Unit 1: The Real Numbers

**Quiz 1-1: Integers & Fractions**

**Part I - Integers & Absolute Value**

**Directions:** Find each sum, difference, product, or quotient.

- $-10 + 6$
- $25 + (-5)$
- $9 - 17$
- $-17 - (-12)$

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
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Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Topic: \_\_\_\_\_ Class: \_\_\_\_\_

**Main Ideas/Questions** **Notes/Examples**

**Exponents**

In the case of repeated multiplication with the same number, rewrite the expression using **exponents**. For example:  $4 \cdot 4 \cdot 4$ .

**Parts of an exponential expression:**  $\square \rightarrow x^n$

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Topic: \_\_\_\_\_ Class: \_\_\_\_\_

**Main Ideas/Questions** **Notes/Examples**

**PERFECT SQUARES**

The square of an integer is called a **perfect square**.

**Generate the first 10 perfect squares below:**

$1^2$   $2^2$   $3^2$   $4^2$   $5^2$   $6^2$   $7^2$   $8^2$   $9^2$   $10^2$

**SQUARE ROOTS**

The opposite of squaring a number is finding the **square root**.

Name: \_\_\_\_\_ Unit 1: The Real Numbers  
 Date: \_\_\_\_\_ Per: \_\_\_\_\_ Homework 4: Square and Cube Roots

**1.** Circle each value that is a perfect square.

50    81    289    360    4    100    75    224    25

**Directions:** Find each square root.

2. $\sqrt{36}$	3. $-\sqrt{225}$	4. $-\sqrt{64}$
5. $\sqrt{324}$	6. $\sqrt{121}$	7. $-\sqrt{169}$
8. $\sqrt{\frac{16}{9}}$	9. $\sqrt{\frac{81}{400}}$	10. $\sqrt{\frac{1}{100}}$

**Directions:** Identify the two consecutive integers in which each square root lies between.

11. $\sqrt{95}$	12. $\sqrt{320}$	13. $-\sqrt{17}$
14. $\sqrt{18}$	15. $-\sqrt{249}$	

## COMPARING & ORDERING

Integers, Fractions, Decimals, Percents, Exponents, Square Roots, Cube Roots, and Scientific Notation

- Helpful Hints:**
- Always **SIMPLIFY** when possible.
  - Write fractions, percents, and non-perfect square/cube roots in simplest form.
  - Convert scientific notation to standard form.

**SET I** Order each set of numbers from **LEAST** to **GREATEST**.

- $\frac{2}{5}, 5.8 \times 10^{-2}, \sqrt{3}, 6\%, \frac{4}{9}, 2^4$
- 125%,  $\frac{15}{8}, \sqrt[3]{6}, 1.3 \times 10^4, \sqrt{19}, 1\frac{1}{9}$
- $4^{-2}, 7\%, \frac{1}{15}, 0.6, \frac{2}{29}, 6.8 \times 10^{-2}$
- $\sqrt[3]{27}, 3.5 \times 10^2, \frac{1}{3}, \sqrt{15}, 35\%, \frac{24}{7}$
- $6^4, 1.296 \times 10^4, 130\%, 1.3, 5^6, \frac{5}{4}$

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Topic: \_\_\_\_\_ Class: \_\_\_\_\_

**Main Ideas/Questions** **Notes/Examples**

**Evaluating Expressions**

- What is an algebraic expression or more \_\_\_\_\_
- To evaluate: \_\_\_\_\_ then follow the \_\_\_\_\_

**Examples**

**Directions:** Evaluate each expression.

- $7x + 4y$  if  $x = 5$  and  $y = -2$
- $4m^2 + 5m$  if  $m = -3$
- $(ab)^2 - 4b^2 + 1$  if  $a = 3$  and  $b = -2$
- $7(w-v)^2 + 2v - 7w$  if  $w = 4$  and  $v = -1$

## Unit 1 Test Study Guide (The Real Numbers)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Topic 1: Integers & Absolute Value**

**Directions:** Find each sum, difference, product, or quotient.

1. $-10 + 16$	2. $3 - 24$	3. $-15 + (-11)$	4. $-8 - 9$	5. _____
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**Directions:** Simplify each expression.

6. $ -14 $	7. $ 15  -  -9 $	8. $ -13 + 2 $	9. $ 7 - 11 $
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**Topic 2: Fractions, Decimals, & Percents**

**Directions:** Complete the chart below.

	Fraction	Decimal	Percent
10.	$\frac{37}{50}$		
11.			
12.		$-0.2$	
13.			16%

**Directions:** Find each sum, difference, product, or quotient.

14. $-\frac{3}{4} + \frac{1}{6}$	15. $-\frac{5}{12} - \frac{3}{3}$	16. $2\frac{1}{3} + (-4\frac{5}{6})$
17. $\frac{2}{5} - \frac{1}{6}$	18. $1\frac{1}{2} + 8$	19. $-3\frac{4}{7} + -1\frac{1}{14}$

20. How many flags can be made from  $116\frac{1}{4}$  yards of fabric if each flag requires  $2\frac{2}{9}$  yards?

Name: \_\_\_\_\_ Unit 1 Test  
 Date: \_\_\_\_\_ Per: \_\_\_\_\_ The Real Numbers

**For questions 1-10, evaluate each expression.**

1. $-17 - 14$	2. $-6 - 8$	3. $\frac{56}{-4}$	4. $-12 - (-19)$
5. $-11 +  14 $	6. $ -4 - 5 $		
7. Write $\frac{3}{8}$ as a percent.	8. Write $\frac{19}{25}$ as a decimal.		
9. Write $0.6$ as a fraction in simplest form.	10. Write 8% as a fraction in simplest form.		

**For questions 11-14, evaluate each expression. Give each answer as a mixed number in simplest form.**

11. $-2\frac{1}{6} + 3\frac{5}{8}$	12. $3\frac{5}{9} - (-1\frac{1}{6})$
13. $-3\frac{5}{7} - 3\frac{8}{9}$	14. $2\frac{1}{2} + 1\frac{3}{10}$