**INTRODUCTION TO GOEMTERY**

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

**UNIT 1 – THE REAL NUMBER SYSTEM**

**Lesson 1: Real Number Properties**

In previous math courses, you studied an infinite set of numbers called the **Real Numbers**.

Irrational

Rational

Integers

Whole

The Real Numbers

We can represent the real numbers with a number line, with each position or point on the number line corresponding to a number. We say that the number is the **coordinate**of that point.

0

1

2

3

4

5

-1

-2

-3

-4

-5

A

B

C

***Ex. 1:***

1. Give the approximate coordinate of each of the points labeled on the line above.

b) Give one possible name for the line above.

Let’s review the real number properties.

Given real numbers **a**, **b**, and **c** we have the following properties:

1. **Closure**:  is a real number  is a real number

2. **Commutative Property** 3. **Associative Property**

4. **Identity Property** 5. **Inverse Property**

6. **Distributive Property** 7. **Zero Product Law**

***Ex. 2:*** Determine which property is being illustrated in each equation.

 a)  d) 

 b)  e) 

 c)  f) 

***Ex. 3:*** Explain why the set of positive real numbers is not closed under subtraction.

***Ex. 4:*** What operation is the set of negative real numbers not closed under?

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 ***Think About It***

 If  and  explain why 

**Lesson 2: Solving Equations**

**Intro to Geometry**

**AIM**: 🠖 To understand the importance of combining like terms and using inverse operations
 to solve an equation

 🠖 To solve linear equations with variables on both sides

Write an example using letters or numbers for each of the following real number properties.

 (a) Commutative Property (d) Identity Property

 (b) Associative Property (e) Inverse Property

 (c) Distributive Property (f) Zero Product Law

The real number properties, among others, will help us to simplify and balance equations so that we can efficiently solve them.

Before we begin solving, let’s practice combining like terms in various expressions.

|  |  |  |
| --- | --- | --- |
| 1.  | 2.  | 3.  |
| 4.  | 5.  | 6.  *\*PEMDAS!* |

­­­­­­­­­­­­­­­­
 Solve each of the following one-step linear equations by applying the inverse for each
 operation that occurs.

***Solving***

1.  2. 

3.  4. 

Solve each of the following two-step linear equations for the value of *x*.

5.  6.  7. 

\*As long as we perform the same operation on both sides of the equation, the equation remains valid.
 Sometimes we need to combine like terms first, before performing operations.

8. Solve each of the following equations.

[a] [b] [c]

**Solving Equations Homework**

**Intro to Geometry**

1. Simplify the following expressions.

(a)  (b)  (c) 

(d)  (e) 

2. Solve the following equations.

(a)  (b)  (c)  (d) 

(e)  (f)  (g)  (h) 

3. Solve the following equations. Note it may be necessary to combine like terms before solving.

(a)  (b)  (c) 

(d)  (e)  (f) 

4. Evaluate each expression if  and 

 (a)  (b)  (c) 

 **Lesson 3: Simplifying Radicals
Intro to Geometry**

**AIM**: 🠖 To simplify radicals by finding perfect square factors
 🠖 To multiply and divide radicals and efficiently simplify the results if needed

Do
Now

Now

 Make a list of the perfect squares from 1 to 400. Please
 list them in the following manner:

1.  11)
2.  12)
3.  13)
4. 14)
5. 15)
6. 16)
7. 17)
8. 18)
9. 19)
10. 20)

Your perfect squares list will be a valuable reference as you recall how to simplify radical expressions.

***Ex 1:*** Express each of the following square roots in simplest radical form.

 (a) (b) (c) 

 (d)  (e)  (f) 

***Ex 2:*** Between what two consecutive integers must  lie? Explain your answer without the use of
 a calculator.

# The Multiplication Property of Square Roots

 for all real numbers, *a* and *b*, such that 

***Ex 3:*** Evaluate each of the following square root products.

(a)  (b)  (c) 

Division Property of Square Roots

 where 

***Ex 4:*** Evaluate each of the following division problems.

(a)  (b)  (c) 

(d)  (e) 

**Simplifying Radicals HOMEWORK
Intro to Geometry**

1. Express each of the following square roots in simplest radical form.

 (a)  (b)  (c) 

 (d)  (e)  (f) 

2. Evaluate each of the following division problems.

 (a)  (b) 

3. Perform each division and leave your answer in *simplest radical form.*

 (a)  (b)  (c) 

***Lesson 4: Adding & Subtracting Radicals
Intro to Geometry***

**AIM**: 🠖 To review combining Like Terms
 🠖 To combine radicals using addition & subtraction

Do
Now

 Combine the following expressions:

 (a)  (b)  (c) 

 We add and subtract radicals in a way very similar to combining like terms.

# Addition and Subtraction of Square Roots

If *a* and *b* are two positive real numbers, then in general:



The same can be said about subtraction of square roots.

\*To add & subtract radicals, the radicands must be the same.

***Ex. 1*** Combine the following radical expressions.

 (a)  (b) 

Sometimes we can combine those without like radicands by simplifying radicals first.

***Ex. 2*** Combine the following square roots by first simplifying radicals.

 (a)  (b) 

(c)  (d) 

(e)  (f) 

***Ex. 3*** Which of the following is equivalent to 

1.  (c) 

 (b)  (d) 

**Combining Square Roots Using Addition and Subtraction**

**Intro to Geometry Homework**

**Skills**

Use addition or subtraction to combine the following square roots that have the same radicands.

1.  2.  3. 

For problems 4 through 12, combine each of the following expressions by first simplifying the square roots and then combining like radicands. Express each answer in *simplest radical form*.

4.  5.  6. 

7.  8.  9. 

10.  11.  12. 

13.  14.  15. 

16.  17.  18. 