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

**Algebra Ch. 1 Uses of Variables**

**Algebra 1-1: Variables in Sentences**

**Warm-Up**

1. Name 2 similarities **and** 2 differences between the following…

4x + 2 = 10 4x + 2

|  |  |
| --- | --- |
| **Similarities** | **Differences** |
| 1. | 1. |
| 2. | 2. |

1. What is a verb? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Define the following symbols…
	1. < \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b. > \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. ≥ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ d. ≤ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e. √ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| **Vocab Word** | **Definition** | **Example** |
| **Variable** |  |  |
| **Sentence** |  |  |
| **Math Verbs** |  |  |
| **Equation** |  |  |
| **Expression** |  |  |
| **Inequality** |  |  |
| **Open Sentence** |  |  |
| **Solution** |  |  |

**Example Problems**

1. Write an **inequality** that compares 2/5 and ¾.
2. Which of the numbers 7, 8, 9, or 10 is a **solution** to the open sentence 2x + 42 > 7x?
3. Find **all** integer solutions to x2 = 81.
4. Find **all** integer solutions to x3 = -8.
5. Bob earns more than $25 a week.
	1. Write an **open sentence** describing the amounts, *e*, that Bob can earn in a week.
	2. List three possible solutions.

**Assignment: 1-1 #’s 2, 7-23, 26-32**

**(Complete on loose-leaf paper in your binder, not in notebook)**

**Algebra 1-2: Sets and Domains**

**Warm-Up**

Graph on a number line.

1. x = 4

2. t = -3.5

3. u > 4

4. s < -2

5. List 3 possible solutions for r if 7 < r. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. List 3 possible solutions for s if -4 < s < 3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| **Vocab Word** | **Definition** | **Example** |
| **Set** |  |  |
| **Element/****Member** |  |  |
| **Types of Numbers** |  |  |
| **Counting** |  |  |
| **Whole** |  |  |
| **Integers** |  |  |
| **Real** |  |  |
| **Domain** |  |  |
| **Reasonable Domain** |  |  |
| **Open vs. Closed Intervals** |  |  |
| **Discrete vs. Continuous** |  |  |

**Example Problems**

1. **Graph** all solutions to x > 4 for the given domain.

 a. Whole Numbers

 b. Integers

 c. Real Numbers

2. King’s Used Cars sold from 24 to 30 cars each week last month. Let *n* = # of cars sold.

 a. Give the **domain** of n. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b. Write an **inequality** to describe *n*. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 c. **Graph** the solution set to part b.

3.

 -5 6

 a. Write an **inequality** to describe the interval above. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b. Is the interval ***open, closed, or neither***? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Assignment: 1-2 #’ 5-12, 15, 16, 19-23, 25-30**

**Algebra 1-3: Operations with Sets- Union & Intersection**

**Warm-Up**

Graph on a number line.

1. x > 6, where x is a real number.

2. x > 6, where x is a whole number.

3. x > 6, where x is an integer.

4. -2 < x ≤ 5, where x is an integer.

5. -2 < x ≤ 5, where x is a real number.

|  |  |  |
| --- | --- | --- |
| **Vocab Word** | **Definition** | **Example** |
| **Intersection** of Sets |  |  |
| **Union** of Sets |  |  |
| **Empty Set****(null)** |  |  |
| **Venn Diagram** |  |  |

**Example Problems**

1. A: {0, 1, 9, 11, 12, 19} Find A ∩ B. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 B: {-3, 1, 2, 4, 9, 19, 25}

 Find A ∪ B. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Make a Venn Diagram to show the **intersection** of sets A & B.

2. a) Graph the set of real numbers m ≤ 1.

 b) Graph the set of real numbers m > -2.

 c) Graph the set of all numbers *m* such

 that m ≤ 1 **and** m > -2.

3. You want to bake a cake and brownies at the same time in the oven. The cake calls for oven temperatures that range from 300 to 350 degrees. The brownies call for oven temperatures ranging from 325 to 375 degrees.

 a. Describe each interval with an **inequality**. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b. Graph each interval in part a.

 c. Describe their **intersection** with an inequality. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 d. What temperatures are right for **both** a cake and brownies? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. L: {Set of even whole numbers} Find L ∩ M. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 M: {Set of odd whole numbers}

 Find L ∪ M. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Assignment: 1-3 #’ s 1-5, 8-12b, 13, 14, 16, 18, 21-23**

**Algebra 1-4: Variables in Expressions**

**Warm-Up**

A = {Whole Numbers} 1. Find A ∩ B. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B = {Integers} 2. Find A ∪ B. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Evaluate if x = 5.

3. 3x \_\_\_\_\_\_\_\_\_\_ 4. -8x \_\_\_\_\_\_\_\_\_\_ 5. 10 + x2\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| **Numeric Expression** | **Algebraic Expression** |
|  |  |

**Order of Operations- Use to *evaluate ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ) and simplify.***

**P**

**E**

**M**

**D**

**A**

**S**

**Example Problems**

Is the expression numeric or algebraic?

1. a. 2a + b b. (3 + -5) 3 c. 3(x + 8y)

 4 8

Simplify.

2. 4 – 32 + 6 • 23 3. 2 + 5 • 8 – 6 • 5

Evaluate when e = 5, f = 3, and g = 0.

4. 4e 5. 2(e+f) 6. g2 + 22 7. e – fg 8. efg

**Assignment: 1-4 #’s 1-13, 16-20, 23-27**

**Algebra 1-5: Variables in Formulas**

**Warm-Up**

1. Evaluate 4n2 when n = 3. \_\_\_\_\_\_\_\_\_\_\_\_\_

2. Evaluate (4n)2 when n = 3. \_\_\_\_\_\_\_\_\_\_\_\_\_

3. Find a value of n so that the value of 4n2 is the same as the value of (4n)2 . \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| **Vocab Word** | **Definition** | **Example** |
| **Formula** |  |  |
| **“In terms of…”****“Depends on…”** |  |  |

**Common Formulas**

Perimeter of a Square/Rectangle = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Area of a Square/Rectangle = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Distance = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Circumference ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ) of a Circle = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Example Problems**

1. If a car is traveling at r miles per hour and the brakes are applied, the car will take approximately d feet to stop, where .

a. This is a formula for \_\_\_\_\_ in terms of \_\_\_\_\_.

 b. \_\_\_\_\_ depends on \_\_\_\_\_\_.

 c. What is the approximate braking distance for a car traveling 50 miles per hour?

2. Find the circumference of a circle with a radius of 5 cm.

3. Find the distance you traveled if you drove 60 mph for 2.5 hours.

4. Find the perimeter of a rectangle with a length of 4 feet and a width of 3.5 feet.

5. Book Example- pg. 28.

is a formula for finding the number of cars that should be allowed on a road at a given time.

L = number of lanes on road

d = length of road (in feet)

s = average speed of car (mph)

About how many cars can safely be on a 5-mile stretch of a 4-lane highway if the average speed of the cars is 60 mph? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Assignment: 1-5 #’s 5-21, skip 13, 15, 16, 20**

**Algebra 1-6: Square Roots & Radicals**

**Day I**

**Warm-Up**

Find the value of each without a calculator.

1.  6. 

2.  7. 

3.  8. 

4.  9. 

5.  10. 

Find the value of each with a calculator.

11.  13. 

12.  14. 

|  |  |  |
| --- | --- | --- |
| **Vocab Word** | **Definition** | **Example** |
| **Square** |  |  |
| **Square Root** |  |  |
| **Radical Sign** |  |  |
| **Perfect Square** |  |  |

**Extra Key Points**

* **When taking the square root to solve an equation, there are \_\_\_\_\_ solutions.**
* **Area of a Square = \_\_\_\_\_\_\_\_\_\_**
* **\_\_\_\_\_\_\_ • \_\_\_\_\_\_\_ = \_\_\_\_\_\_\_**

|  |  |
| --- | --- |
| **Exact Solution**  | **Approximate Solution** |
|  |  |

**Example Problems**

1. Find the area of a square with a side length of 7 in. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Find the side length of a square with an area of 16 cm2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Find the **exact and approximate** side length of a square with an area of 20 ft2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. List all the **perfect squares** (must form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_), from least to greatest up to 144.

5. Estimatewithout a calculator. Check with a calculator.

 (Hint: Find the 2 perfect squares that 10 is between.)

Multiply.

6.  7.  8. 

Evaluate.

9.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 10.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 11.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Assignment: 1-6 #’ s 1 - 10, 13 – 24, 26 – 32 Even**

**Algebra 1-6: Square Roots & Radicals**

**Day II**

**Warm-Up**

1. It took 130 square yards of carpet to cover a square floor. Give the length of the room…

a) As an exact answer. \_\_\_\_\_\_\_\_\_\_

b) As an approximated answer to the nearest hundredth. \_\_\_\_\_\_\_\_\_\_

2. Evaluate  . \_\_\_\_\_\_\_\_\_\_

3. Estimate without a calculator. \_\_\_\_\_\_\_\_\_\_

4. Multiply without using a calculator.

 a)  \_\_\_\_\_\_\_\_\_\_

 b)  \_\_\_\_\_\_\_\_\_\_

 c)  \_\_\_\_\_\_\_\_\_\_

5. Solve  .

1. Give exact solution(s). \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Give the solution(s) rounded to the nearest hundredth. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Assignment: 1-6 Wkst**

**Algebra 1-7: Writing Patterns**

**Warm-Up- None, Double Lesson**

|  |  |  |
| --- | --- | --- |
| **Vocab Word** | **Definition** | **Example** |
| **Instance** |  |  |
| **Counterexample** |  |  |
| **Pattern** |  |  |

**Example Problems**

1. One salad cost $1.75 and one bottle of juice costs $1.25.

a) Write the pattern for finding the total cost of s salads and b bottles of juice.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Find a formula for T, the total costs of s salads and b bottles of juice.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Consider these instances.

a) Describe the pattern using variables. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_









b) Is this pattern true for all numbers? If not, find a counterexample. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Algebra 1-9: Finding Formulas Using Tables**

**Example Problems**

1. Which formula describes the numbers in the table?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | 1 | 4 | 9 | 16 |
| y | 1 | 2 | 3 | 4 |

a) y = x + 2 b) y = 2x c)  d. y = x2

For numbers 2-4, match each table with its formula.

a) y = x + 5 b) y = 5x c) y = 5x

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | 1 | 2 | 3 | 4 |
| y | 5 | 10 | 15 | 20 |

2.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | 1 | 2 | 3 | 4 |
| y | 5 | 25 | 125 | 625 |

3.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | 1 | 2 | 3 | 4 |
| y | 6 | 7 | 8 | 9 |

4.

5. Take out one full sheet of paper. This one sheet of paper has a thickness of 1.

 a) Fold it in half and record the thickness of the folded paper.

 b) Fold it in half again and record the thickness of the folded paper.

 c) Continue to fold and record data.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| n = the number of folds | 1 | 2 | 3 | 4 |
| t = thickness of folded paper |  |  |  |  |

d) Find a formula for t in terms of n. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e) How thick would the folded paper be if you could do 9 folds? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Assignment: 1-7 #’ s 13-18**

 **1-9 #’s 4-6, 11, 14, 15**

**Algebra 1-8: The Pythagorean Theorem**

**Warm-Up**

Evaluate.

1. 42 + 22 4. 

2. 62 + 32 5. 

3. 12 + 82 6. 

|  |  |  |
| --- | --- | --- |
| **Vocab Word** | **Definition** | **Example** |
| **Legs** |  |  |
| **Hypotenuse** |  |  |
| **Pythagorean Theorem** |  |  |

**Example Problems**

1. Find the length of the hypotenuse if the legs of a right triangle are 3 inches and 2 inches long. \_\_\_\_\_\_\_\_\_\_\_\_\_

2. Find the length of the hypotenuse if the legs of a right triangle are 4 feet and 5 feet long. \_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. To get to school, Ed travels 2.5 miles east and 1.5 miles north. If he could travel to school in a straight line, how far would he have to go? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Central Park in NYC is shaped like a rectangle. It is .8 kilometers wide and 4 kilometers long. They want to make a path from one corner to the opposite corner. How long will it be? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Assignment: 1-8 #’ s 1 - 15, skip 3 & 5, 16-24 Even**