

Name \_\_\_\_\_

**Match each property or identity with the appropriate definition.**

1. \_\_\_\_\_ **Multiplicative Identity - D**

A. Adding opposites produces a result that is the additive identity “0”

2. \_\_\_\_\_ **Reflexive Property - G**

B. When a value on the right side of a set of parentheses, is multiplied across terms separated by an operation of addition.

3. \_\_\_\_\_ **Additive Inverse - A**

C. Any number multiplied by zero will produce an answer of zero.

4. \_\_\_\_\_ **Distributive Property - B**  
**from right over addition**

D. When the product of a number and one is taken, the result is that the number is unchanged.

5. \_\_\_\_\_ **Commutative Property - H**  
**for Addition**

E. This is when the R.H.S. and L.H.S. of an equation are switched, but the individual terms are left in the same order.

6. \_\_\_\_\_ **Symmetric Property - E**

F. When a series of terms are being added together one can regroup the terms using parentheses but the end result is left unchanged.

G. This occurs when an exact copy or duplicate of an expression or equation

H. When a series of terms are being added together one can rearrange the terms without effecting the end result.

Match each property or identity with the appropriate example.

1. \_\_\_\_\_ Transitive Property - **G**

A.  $(de)f = d(ef)$

2. \_\_\_\_\_ Substitution Property - **K**

B.  $-\frac{5}{7} = -\frac{5}{7} + 0$

3. \_\_\_\_\_ Associative Property - **A**  
for Multiplication

C.  $2(5)(9) = 2(9)(5)$

4. \_\_\_\_\_ Distributive Property - **I**  
from right over subtraction

D.  $-6 + 6 = 0$

5. \_\_\_\_\_ Additive Identity - **B**

E. If  $A - 7 = B + 4$ ,  
then  $B + 4 = A - 7$

6. \_\_\_\_\_ Multiplicative Inverse - **L**

F.  $7(2x + 3) = 14x + 21$

7. \_\_\_\_\_ Commutative Property - **C**  
for Multiplication

G. If  $2(5) = 7 + 3$  and  $7 + 3 = 10$ ,  
then  $2(5) = 10$

8. \_\_\_\_\_ Symmetric Property - **E**

H.  $7 + 2 + 5 = 2 + 5 + 7$

9. \_\_\_\_\_ Multiplicative Property of Zero - **J**

I.  $(4p - 5)2 = 8p - 10$

J.  $-\frac{4}{5}(0) = 0$

K.  $11^2 + [6 - 3] = 121 + 3$

L.  $1 = \frac{-1}{17} \cdot \frac{-17}{1}$

Find the pattern and fill in the blanks

A. 5, 6, 4, 7, 3, 8,  
**+ 1, - 2, + 3, - 4, + 6, - 7, ...**

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
**2, 9, 1, 10**

B. 1, 3, 1, 2, 6, 4, 5, 15, 13, 14  
**x 3, -2, +1, ...**

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
**42, 40, 41**

**Determine if each of the following operations are closed under the given number set.**

1. {Odd Integers}; multiplication

1. \_\_\_\_\_

Counter example if applicable:

odd x odd always equals odd

Closed

2. {Whole};  $-A \cdot (B - 5)$

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

Counter example if applicable:

consider whole numbers 5 and 7, so  $-5(7 - 5) = -10$

Not Closed

3. {Odd Integers}; subtraction

3. \_\_\_\_\_

Counter example if applicable:

$-3 - 1 = -4$

Not Closed

4. {Even Whole}; addition

4. \_\_\_\_\_

Counter example if applicable:

even + even always = even

Closed

5. {Odd Integers};  $(A - 1) + (B + 2)$

5. \_\_\_\_\_

Counter example if applicable:

consider integer numbers  $-3$  and  $7$ , so  $(-3 - 1) + (7 + 2) = 5$

Closed

$A - 1 = \text{even}$ ,  $B + 2 = \text{odd}$  so even + odd always = odd

**Use the Distributive Property to simplify each expression.**

$$3(8x - 1) - 5(2x + 3)$$

6.  $24x - 3 - 10x - 15$

6. \_\_\_\_\_

$$14x - 18$$

$$5(2k + 3) - 7(2k - 1) + 2k$$

7.  $10k + 15 - 14k + 7 + 2k$

7. \_\_\_\_\_

$$-2k + 22$$

$$\frac{2}{5}(10k + 25) - \frac{3}{4}(12k - 8) + 2k$$

8.  $4k + 10 - 9k + 6 + 2k$

8. \_\_\_\_\_

$$-3k + 16$$

### Order of Operation

$$\left(\frac{1}{3}\right)^2 - \left[\frac{2}{3} + \frac{1}{5} \div 2 \cdot \frac{5}{6} - \frac{3}{4}\right]$$

$$\frac{1}{9} - \left[\frac{2}{3} + \frac{1}{5} \cdot \frac{1}{2} \cdot \frac{5}{6} - \frac{3}{4}\right]$$

1.  $\frac{1}{9} - \left[\frac{2}{3} + \frac{1}{12} - \frac{3}{4}\right]$

$$\frac{1}{9} - \left[\frac{8}{12} + \frac{1}{12} - \frac{9}{12}\right]$$

$$\frac{1}{9} - \left[\frac{0}{12}\right]$$

$$\frac{1}{9}$$

1. \_\_\_\_\_

$$\left(\frac{8}{9} - \frac{2}{3}\right) \div \frac{4}{9} - \frac{1}{2} \cdot \frac{1}{5}$$

$$\left(\frac{8}{9} - \frac{6}{9}\right) \div \frac{4}{9} - \frac{1}{2} \cdot \frac{1}{5}$$

2.  $\left(\frac{2}{9}\right) \cdot \frac{9}{4} - \frac{1}{2} \cdot \frac{1}{5}$

$$\frac{1}{2} - \frac{1}{10}$$

$$\frac{5}{10} - \frac{1}{10}$$

$$\frac{4}{10} = \frac{2}{5}$$

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

**Write the Solution Set to each of the following.**

3.  $9x - 20 = x^2$  replacement set =  $\{-3, 4, 5, 10\}$

3. \_\_\_\_\_

$\{4, 5\}$

4.  $5x + 7 < 10x$  replacement set =  $\{-7, -1, 3, 4, 11\}$

4. \_\_\_\_\_

$\{3, 4, 11\}$

5.  $x^2 - 11 \geq x$  replacement set =  $\{-4, -1, 1, 4, 10\}$

5. \_\_\_\_\_

$\{-4, 4, 10\}$