

Name _____

1. L Additive Identity

2. F Reflexive Property

3. I Transitive Property

4. G Commutative Property for Addition

5. J Symmetric Property

6. E Associative Property for Addition

7. K Commutative Property for Multiplication

8. C Multiplicative Inverse

9. H Substitution Property

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

MULTIPLICATIVE IDENTITY

B. Any number **multiplied** by **zero** will produce an answer of zero.

MULTIPLICATIVE PROPERTY OF ZERO

C. Multiplying **reciprocals** produces a result that is the multiplicative identity "1"

MULTIPLICATIVE INVERSE

D. **Adding opposites** produces a result that is the additive identity "0"

ADDITIVE INVERSE

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

ASSOCIATIVITY FOR ADDITION

F. This occurs when an **exact copy** or duplicate of an expression or equation is created.

REFLEXIVE

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

COMMUTATIVE Prop FOR ADDITION

H. This is the catch 22, If no other property or identity describes the scenario this "**replacement property**" should be used.

SUBSTITUTION

I. Two valid statements will initially be given, one can then logically arrive at a third valid statement by **passing on the shared trait**.

TRANSITIVE

J. 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.

SYMMETRIC

K. When a series of terms are being **multiplied** together one can **rearrange** the terms without effecting the end result.

COMMUTATIVE Prop FOR MULT.

L. When the **sum** of a number and **zero** is taken, the result is that the number is unchanged.

ADDITIVE IDENTITY

1. F Distributive Property from left over subtraction
 - A. If $w = 3f - 7$, then $3f - 7 = w$
 - B. $(4p - 5)2 = 8p - 10$
 - C. $5(7) - 11 = 35 - 11$
 - D. $5 \cdot 7 \cdot 0 \cdot 3 = 0$
 - E. $abc = bca = cba$
 - F. $8(3w - 9) = 24w - 72$
 - G. $11y + 2 = 11y + 2$
 - H. $7 \cdot (3 \cdot 4) \cdot 2 = 7 \cdot [(3 \cdot 4) \cdot 2]$
 - I. $B \cdot \left(\frac{1}{B}\right) = 1$
 - J. If $3(6) = 10 + 8$ & $10 + 8 = 18$, then $3(6) = 18$
 - K. $(3w + 7)5 = 15w + 35$
 - L. $7 + 2 + 5 = 2 + 5 + 7$
2. L Commutative Property for Addition
3. A Symmetric Property
4. E Commutative Property for Multiplication
5. K Distributive Property from right over addition
6. H Associative Property for Multiplication
7. J Transitive Property
8. I Multiplicative Inverse
9. C Substitution Property

Conceptual Questions

1. Match each number system with the appropriate number set. Each letter will only be used once so use the letter that best depicts the number system.

E Natural / Counting Numbers -

A. $\{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$ INTEGERS

C Whole Numbers -

B. $\left\{-7\frac{1}{2}, -\frac{\sqrt{5}}{2}, 3, \sqrt{29}, 5\frac{4}{7}, \sqrt{49}\right\}$ REAL

A Integer Numbers -

C. $\{0, 1, 2, 3, \dots\}$ WHOLE

F Rational Numbers -

D. $\left\{-\sqrt{15}, -\frac{\sqrt{22}}{2}, \sqrt{3}, \pi + 4, \sqrt{53}\right\}$ IRRATIONAL

D Irrational Numbers -

E. $\{1, 2, 3, \dots\}$ NATURAL

B Real Numbers -

F. $\left\{-5\frac{2}{3}, -\frac{4}{7}, 2, 3\frac{3}{4}, \sqrt{36}\right\}$ RATIONAL

Knowing the Squares

1. $23^2 =$

1. 529

2. $17^2 =$

2. 289

3. $13^2 =$

3. 169

4. $25^2 =$

4. 625

5. $19^2 =$

5. 361

6. $22^2 =$

6. 484

7. $16^2 =$

7. 256

Simplify Using The Distributive Property

Show your work!

Name _____

$$\begin{aligned} 1. \quad & 4(3x - 5) - 7(2x + 5) \\ & \underline{12x - 20} \quad \underline{-14x - 35} \\ & -2x - 55 \end{aligned}$$

1. $-2x - 55$

$$\begin{aligned} 2. \quad & 8(3k + 7) - 5(2k - 2) + 4k \\ & \underline{24k + 56} \quad \underline{-10k + 10} \quad \underline{+4k} \\ & 18k + 66 \end{aligned}$$

2. $18k + 66$

$$\begin{aligned} 3. \quad & -9 + 4(2g + 5) + 7(3g - 2) - 7g \\ & -9 + \underline{8g + 20} \quad \underline{+21g - 14} \quad \underline{-7g} \\ & 22g - 3 \end{aligned}$$

3. $22g - 3$

$$\begin{aligned} 4. \quad & \frac{4}{7}(21f + 14) - \frac{3}{5}(25f - 35) + 6f \\ & \underline{12f + 8} \quad \underline{-15f + 21} \quad \underline{+6f} \\ & 3f + 29 \end{aligned}$$

4. $3f + 29$

$$\begin{aligned} 5. \quad & \frac{2}{3}(6w + 15) - 4(5w - 3) + 3w \\ & \underline{4w + 10} \quad \underline{-20w + 12} \quad \underline{+3w} \\ & -13w + 22 \end{aligned}$$

5. $-13w + 22$

Order of Operations Show your work!

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

\downarrow
 $\frac{1}{8} - \left[\left(\frac{8}{12} + \frac{3}{12}\right) \cdot \frac{6}{5}\right]$

$\frac{1}{8} - \left[\frac{11}{12} \cdot \frac{6}{5}\right]$

$\frac{1}{8} - \frac{11}{10}$

$\frac{5 - 44}{40}$

$-\frac{39}{40}$

2. $6 - \left[\frac{2+7}{3} - (2 \cdot 3 - 5)\right] =$

$6 - \left[\frac{9}{3} - (6 - 5)\right]$

$6 - [3 - 1]$

$6 - 2$

4

Order of Operations

$(-6) \left[\frac{1}{2} \left(\frac{7}{9} + \frac{1}{3}\right) \div \frac{5}{6}\right] =$

$-6 \left[\frac{1}{2} \left(\frac{7}{9} + \frac{3}{9}\right) \cdot \frac{6}{5}\right]$

$-6 \left[\frac{1}{2} \left(\frac{10}{9}\right) \cdot \frac{6}{5}\right]$

$-6 \left[\frac{5}{9} \cdot \frac{6}{5}\right]$

$-6 \left[\frac{2}{3}\right]$

-4

4. $\left(\frac{1}{2}\right)^2 + \left[\frac{1}{5} - \frac{2}{3} \cdot \frac{6}{7} \div \frac{5}{14} + \frac{2}{5}\right] =$

$\frac{1}{4} + \left[\frac{1}{5} - \frac{4}{7} \cdot \frac{14}{5} + \frac{2}{5}\right]$

$\frac{1}{4} + \left[\frac{1}{5} - \frac{8}{5} + \frac{2}{5}\right]$

$\frac{1}{4} + [-1]$

$-\frac{3}{4}$

Find the solution set

1. $4x+5 \leq 25$

$r = \{-3, -1, 0, 2\}$

✓ $-3: -7 \leq 25$

✓ $-1: 1 \leq 25$

✓ $0: 5 \leq 25$

✓ $2: 13 \leq 25$

1. $\{-3, -1, 0, 2\}$

2. $x^2 - 5 \geq x$

$r = \{-4, -1, 3, 5\}$

✓ $-4: 11 \geq -4$

X $-1: -4 \geq -1$

✓ $3: 4 \geq 3$

✓ $5: 20 \geq 5$

2. $\{-4, 3, 5\}$

3. $3x+7 \leq 28$

$r = \{-2, -1, 7, 11\}$

✓ $-2: 1 \leq 28$

✓ $-1: 4 \leq 28$

✓ $7: 28 \leq 28$

X $11: 40 \leq 11$

3. $\{-2, -1, 7\}$

4. $4x+5 > x^2$

$r = \{-6, -1, 8, 12\}$

X $-6: -19 > 36$

X $-1: 1 > 1$

X $8: 37 > 64$

X $12: 53 > 144$

4. $\{\}$

5. $x^2 - 10 \geq x$

$r = \{-8, -3, -1, 4, 5\}$

✓ $-8: 54 \geq -8$

✓ $-3: -1 \geq -3$

X $-1: -9 \geq -1$

✓ $4: 6 \geq 4$

✓ $5: 15 \geq 5$

5. $\{-8, -3, 4, 5\}$

Exploring Patterns (identify the pattern and fill in the missing number)

A. 5, 8, 16, 19, 38, 41, ~~80~~, 85 41, 82, 85
 $\begin{array}{ccccccc} \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} \\ +3 & \cdot 2 & +3 & \cdot 2 & +3 & \cdot 2 & +3 \end{array}$

B. 13, 8, 16, 11, 22, 17, 34, 29, 58 34, 29, 58
 $\begin{array}{ccccccc} \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} \\ -5 & \cdot 2 & -5 & \cdot 2 & -5 & \cdot 2 & -5 & \cdot 2 \end{array}$

C. 5, 6, 12, 9, 10, 20, 17, 18, 36, 33 18, 36, 33
 $\begin{array}{ccccccc} \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} \\ +1 & \cdot 2 & -3 & +1 & \cdot 2 & -3 & +1 & \cdot 2 & -3 \end{array}$

D. 3, 9, 2, 6, -3, -9, -20, -60, -73, -219 -60, -73, -219
 $\begin{array}{ccccccc} \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} & \sqrt{} \\ \cdot 3 & -7 & \cdot 3 & -9 & \cdot 3 & -11 & \cdot 3 & -13 & \cdot 3 \end{array}$

E. 100, 121, 144, 169, 196, 225, 256, 289
 $10^2 \quad 11^2 \quad 12^2 \quad 13^2 \quad 14^2 \quad 15^2 \quad 16^2 \quad 17^2$

If you have finished early go back and rework your problems. Check for sign mistakes and or addition mistakes.

#22 $\left(\frac{1}{3}\right)^2 - \left[\frac{2}{3} + \frac{1}{5} \div 2 \cdot \frac{5}{6} - \frac{3}{4}\right] =$
 $\frac{1}{9} - \left[\frac{2}{3} + \frac{1}{5} \cdot \frac{1}{2} \cdot \frac{5}{6} - \frac{3}{4}\right]$
 $\frac{1}{9} - \left[\frac{2}{3} + \frac{1}{12} - \frac{3}{4}\right]$
 $\frac{1}{9} - \left[\frac{8+1-9}{12}\right]$
 $\frac{1}{9} - 0$
 $\frac{1}{9}$