

9-13-18

Aim: SWBAT define and identify properties of addition and multiplication.

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Do Now: Packet Page 5

HOMEWORK

Write the OPPOSITE and the ABSOLUTE VALUE of each integer:

1) 7 -7 7

3) -25 25 25

2) 106 -106 106

4) 0 0 0

Complete the statement with < or >.

5) -6 < 4

6) -2 > -4

7) 0 < 8

Match the integer expression with the verbal expression:

E 8) $-|12|$

~~A.~~ the opposite of negative twelve

D 9) $|-12|$

~~B.~~ the absolute value of twelve

C 10) $-|-12|$

C. the opposite of the absolute value of negative twelve

A 11) $-(-12)$

~~D.~~ the absolute value of negative twelve

B 12) $|12|$

~~E.~~ the opposite of the absolute value of twelve

Simplify the expression.

13) $-(-9)$
9

14) $|-16|$
16

15) $-|-16|$
-16

The table below shows the distances of the runners from the finish line when the winner won the race. Use the table to answer Questions 16 - 18.

Runner	Distance (ft)
Sarah	-16
Beth	2
Juanita	0
Tamika	9
Ingrid	-36

16) Who won the race? Juanita

17) Who finished further back, Sarah or

Tamika? Sarah

18) Arrange the girls' names in order from first-place to last-place finish.

Juanita
1st PlaceBeth
2nd PlaceTamika
3rd PlaceSarah
4th PlaceIngrid
5th Place

AIM: SWBAT identify properties of addition and multiplication.

Write the opposite of each integer. *keep the # change the sign "DO NOW"*

- 1) 3 -3 2) -5 5 3) -7 7 4) 9 -9

Evaluate. *Find the value (answer)*

- 5) $|-12|$ 12 6) $|-4|$ 4 7) $|9|$ 9 8) $-|18|$ -18

Compare using < or >. *is less than*

- 9) 8 > -6 10) -7 < -4 11) -9 < 5 12) -7 < -3

Order from least to greatest.

- 13) $-1, -6, 0, -3, -5$ $-6, -5, -3, -1, 0$ 14) $-18, -20, -15, -17$ $-20, -18, -17, -15$

Properties of Addition and Multiplication

1) **Commutative Property of addition and multiplication:** (Commutative, +; Commutative, x)

Changing the order of the numbers without changing the answer. (*#'s commute*)

Examples: A) $2 + 3 = 3 + 2$ B) $4 \cdot 5 = 5 \cdot 4$ *X*

2) **Associative Property of addition and multiplication:** (Associative, +; Associative, x)
Moving the **grouping** symbols without changing the answer.

- Examples: A) $6 + (2 + 3) = (6 + 2) + 3$ B) $7 \cdot (4 \cdot 6) = (7 \cdot 4) \cdot 6$

Same order

3) **Additive Identity Property:** (Identity, +) Identity of # does not change
Any number plus zero equals that number. **The identity element of addition is zero.*

- Examples: A) $9 + 0 = 9$ B) $x + 0 = x$

4) **Multiplicative Identity Property: (Identity, \times) Identity of # does not change**
Any number times one is that number. * *The identity element of multiplication is one.*

Examples: A) $4 \cdot 1 = 4$

B) $x \cdot 1 = x$

* 5) **Additive Inverse Property: (Inverse, +) (Opposites)**

For every number, a , $a + -a = 0$. *Remember: Zero is the identity element

Examples: A) $9 + -9 = 0$

B) $-x + x = 0$

* 6) **Multiplicative Inverse Property: (Inverse, \times) (Reciprocal)**

For every number, a , $a \cdot \frac{1}{a} = 1$ *Remember: One is the identity element

$\frac{2}{3} \rightarrow \frac{3}{2}$

Examples: A) $\frac{4}{1} \cdot \frac{1}{4} = 1$

B) $x \cdot \frac{1}{x} = 1$

7) **Multiplicative Property of Zero: (Zero, \times) (Everything becomes zero)**

Any number times zero is zero

Examples: A) $10 \cdot 0 = 0$

B) $x \cdot 0 = 0$

8) **Distributive Property (over addition or subtraction)**

Multiplying a group by a number (term)

Example: A) $4(x + y) = 4x + 4y$

B) $2(3x + 4) = 2 \cdot 3x + 2 \cdot 4$

$2(3x + 4) = 6x + 8$

NOTE: You can also use the distributive property backwards by factoring out the GCF

Example: $4x + 14 = 2(2x + 7)$

Identify the illustrated property.

1) $(13 + 7) + 8 = 13 + (7 + 8)$

Associative, +

2) $0 \cdot (x + 3) = 0$

Multiplicative, 0

3) $9 \cdot 5 = 5 \cdot 9$

Commutative, \cdot

4) $(62 + 3) + 0 = (62 + 3)$

Identity, +

5) $2(4x + 9) = 8x + 18$

Distributive

* 6) $(19 + 8) + 6 = (8 + 19) + 6$

Commutative, +

7) $(2 \cdot 3) \cdot 7 = 2 \cdot (3 \cdot 7)$

Associative, \cdot

8) $56 \cdot 1 = 56$

Identity, \cdot

9) $2x + 6y = 2(x + 3y)$

Distributive

10) $\frac{7}{1} \cdot \frac{1}{7} = 1$

Inverse, \cdot

* 11) $-6 + (3 \cdot 8) = -6 + (8 \cdot 3)$

Commutative, \cdot

12) $-15 + 15 = 0$

Inverse, +

HOMEWORK

State the name of the property that is shown.

1) $(x + 9) + 1 = x + (9 + 1)$ 1) _____

2) $1 \cdot x = x$ 2) _____

3) $(2 + 3) + 5 = 2 + (3 + 5)$ 3) _____

4) $(12 + 9) + 15 = (9 + 12) + 15$ 4) _____

5) $(2 + 7) \cdot 0 = 0$ 5) _____

6) $12 \cdot (7 \cdot 15) = (12 \cdot 7) \cdot 15$ 6) _____

7) $0 + (9 + 1) = 9 + 1$ 7) _____

8) $3(4x + 9) = 12x + 27$ 8) _____

9) $r \cdot 1 = r$ 9) _____

10) $(8 \cdot 6) \cdot 9 = 8 \cdot (6 \cdot 9)$ 10) _____

11) $106 \cdot 0 = 0$ 11) _____

12) $4(a + b) = 4a + 4b$ 12) _____

13) $-y + y = 0$ 13) _____

14) $(2 + y) + 8 = 8 + (2 + y)$ 14) _____

15) $c \cdot \frac{1}{c} = 1$ 15) _____

16) $(8 \cdot 6) + 9 = (6 \cdot 8) + 9$ 16) _____