

FLORENCE INTERNATIONAL SCHOOL CLASS-VII WORKSHEET-18 MATHS

NAME-....

DATE: 22/04/2020

(*solve the worksheet in a4 sheets.) Properties of Multiplication

<u>Closure under Multiplication</u>
Closure property under multiplication states the product of two integers will always be an integer.

Let's consider the following pairs of integers.

(-5) x (-6) = 30 (Result is an integer)

15 x (-10) = -150 (Result is an integer)

(-7) x (-8) = 56 (Result is an integer)

Since multiplication of integers gives integers, we say integers are closed under multiplication.

In general, a × b is an integer, for all integers a and b.

<u>Commutativity for Multiplication</u>

Commutative property of multiplication states that swapping of terms will not change the product.

Let's consider the following examples.

(-8) x (-12) = (-12) x (-8)

(-11) x 100 = 100 x (-11)

 $(-19) \ge 0 \ge 0 \ge (-19)$

So, we can say that multiplication is commutative for integers.

In general, for any two integers a and b, we can say a x b = b x a

<u>Associativity for Multiplication</u>

Associative property of multiplication states that the way of grouping of numbers will not

change the result.

Let's consider the following example.

(-6) x [(-4) x (-3)] and [(-6) x (-4)] x (-3)

In the first case (-4) and (-3) are grouped together and in the second (-6) and (-4) are grouped together.

(-6) x [(-4) x (-3)] = (-6) x 12 = (-72)

 $[(-6) \times (-4)] \times (-3) = 24 \times (-3) = (-72)$

In both the cases, we get -72.

So, Multiplication is associative for integers.

In general, for any three integers a, b and c $(a \times b) \times c = a \times (b \times c)$

Distributive Property

Distributive property of multiplication explains the distributing ability of an operation over another mathematical operation within a bracket. It can be either distributive property of multiplication over addition or distributive property of multiplication over subtraction. Let's consider the following example.

 $(-2) \times (3 + 5) = -2 \times 8 = -16$ and;

 $[(-2) \times 3] + [(-2) \times 5] = (-6) + (-10) = -16$

So, $(-2) \times (3 + 5) = [(-2) \times 3] + [(-2) \times 5]$

In general, for any integers a, b and c, a × (b + c) = a × b + a × c

<u>Multiplication by Zero</u>

This property of multiplication states that the product of any integer (positive or negative) and zero is zero.

Let's consider the following examples.

 $(-98) \times 0 = 0$

0 x 67 = 0

So, we can say that multiplication of any integer and zero gives zero.

In general, for any integer a, $a \times 0 = 0 \times a = 0$

<u>Multiplicative Identity</u>

Multiplicative identity property states that when we multiply one to any integer, we will get the

integer itself as the product.

Let's observe the following examples:

$$(-16) \times 1 = -16$$

1 x (- 81) = - 81

The above examples show that 1 is the multiplicative identity for integers also.

In general, for any integer a we have, $a \times 1 = 1 \times a = a$

Q1. Find:

- a) 6x(-19)=.....
- b) 12x(-32)=.....
- c) 7x(-22)=.....
- d) (-42)x12=.....
- e) (-55)x15=.....

Q2. Check if:

a) 25x(-21)=(-25)x21

Q3. What will be the sign of the product if we multiply together?

- a) 8 negative integers and 3 positive integers.
- b) 5 negative integers and 4 positive integers
- c) (-1), twelve times?
- d) (-1), 2m times, m is a natural number?

Q4. Fill in the blanks:

- a) 88x.....= -88
- b) (-40)x.....= 80
- c) 3x(-1)x(-15)=.....
- d) (-25)x(-2)=
- e)x(-93)= 93

Q5. Verify the following:

- a) 18x[7+(-3)]= [18x7]+[18x(-3)]
- b) (-21)x[(-4)+(-6)] = [(-21)x(-4)]+[(-21)x(-6)]

Q6. Find the product, using suitable properties:

- a) 8x53x(-125)
- b) 26x(-48)+(-48)x(-36)
- c) 7x(50-2)
- d) (-17)x(-29)

Q7. For a= -17, b= 22 and c= 13, verify each of the following:

- a) a x (b-c)=(a x b) (b x c)
- b) a x (b x c)= (a x b) x c

