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NATURAL NUMBERS AND WHOLE NUMBERS

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 05
CHAPTER NAME : NATURAL NUMBERS AND WHOLE NUMBERS
SUB TOPIC: Properties of whole numbers for Multiplication
PERIOD NO: 4

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Learning outcomes

- **Students will be able to apply properties of division.**
- **Students will be able to relate all properties of all operations on whole numbers.**

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Previous knowledge Test

1.Find the product of the :
(i) greatest number of three digits and smallest number of five digits.
(ii) greatest number of four digits and the greatest number of three digits.

2.Fill in the blanks:
(i) (437 + 3) x (400 – 3) = 397 x …….
(ii) 66 + 44 + 22 = 11 x (……..) = 11 x …….

Natural Numbers and Whole Numbers

Properties of Division

1. Division by 1 Property: If we divide a number by 1 the quotient is the number itself.
For example: 7542 ÷ 1 = 7542

2. Division by itself Property: If we divide a number by the number itself, the quotient is 1.
For example: 275 ÷ 275 = 1

3. Division any Number by 0 Property: Division of a number by 0 is meaningless.
For example: 35 ÷ 0 = no meaning

4. Division of 0 by any Number Property: 0 divided by a number gives 0 as the quotient.
For example: 0 ÷ 25 = 0

Property	Addition	Subtraction	Multiplication	Division
Closure	Yes	No	Yes	No
Commutative	Yes	No	Yes	No
Associative	Yes	No	Yes	No

Evaluation Question EX5.C

8. Evaluate:

(i) 355 × 18

(ii) 6214 × 12

(iii) 15 × 49372

(iv) 9999 × 8

Solution:

(i) 355 × 18

This can be written as

= (300 + 50 + 5) × 18

= (300 × 18) + (50 × 18) + (5 × 18)

= 5400 + 900 + 90

= 6390

Evaluation Question

(ii) 6214 × 12

This can be written as

= (6000 + 200 + 10 + 4) × 12

= (6000 × 12) + (200 × 12) + (10 × 12) + (4 × 12)

= 72000 + 2400 + 120 + 48

= 74568

(iii) 15 × 49372

This can be written as

= 15 × (40000 + 9000 + 300 + 70 + 2)

= (15 × 40000) + (15 × 9000) + (15 × 300) + (15 × 70) + (15 × 2)

= 600000 + 135000 + 4500 + 1050 + 30

= 740580

Evaluation Question EXERCISE 5D

1. Show that:

(i) division of whole numbers is not closed.

(ii) any whole number divided by 1, always gives the number itself.

(iii) every non-zero whole number divided by itself gives 1 (one).

(iv) zero divided by any non-zero number is zero only.

(v) a whole number divided by 0 is not defined.

For each part, given above, give two suitable examples.

Solution:

(i) Example: 5 and 8 are whole numbers, but $5 \div 8$ is not a whole number

Therefore, closure property does not exist for division of whole numbers

(ii) Example: $2 \div 1 = 2$, $18 \div 1 = 18$, $129 \div 1 = 129$

Hence, the given statement, any whole number divided by 1, always gives the number itself is true.

Evaluation Question

iii) Example:

2 ÷ 2 = 1, 128 ÷ 128 = 1, 256 ÷ 256 = 1

Therefore, the given statement, every non-zero whole number divided by itself gives one is true

(iv) Example:

0 ÷ 138 = 0, 0 ÷ 2028 = 0, 0 ÷ 15140 = 0

Therefore, the given statement, zero divided by any non-zero number is zero only, is true

(v) Example:

7 ÷ 0 is not defined

16 ÷ 0 is not defined

Hence, the given statement, a whole number divided by zero is not defined, is true

2. If x is a whole number such that x ÷ x = x, state the value of x.

Evaluation Question

Solution:

We know that, any number divided by 1, always gives the number itself

The value of x can be any number 1, 2, 3, 4, 5,6……and so on.

3. Fill in the blanks:

(i) 987 ÷ 1 = ……..

(ii) 0 ÷ 987 = ……..

(iii) 336 – (888 ÷ 888) = ……

(iv) (23 ÷ 23) – (437 ÷ 437) = ……..

Solution:

(i) 987 ÷ 1 = **987**

(ii) 0 ÷ 987 = **0**

Evaluation Question

(iii) 336 – (888 ÷ 888) = **335**

(iv) (23 ÷ 23) – (437 ÷ 437) = **0**

4. Which of the following statements are true?

(i) 12 ÷ (6 × 2) = (12 ÷ 6) × (12 ÷ 2)

(ii) a ÷ (b – c) = a / b – a / c

(iii) (a – b) ÷ c = a / c – b / c

(iv) (15 – 13) ÷ 8 = (15 ÷ 8) – (13 ÷ 8)

(v) 8 ÷ (15 – 13) = 8 / 15 – 8 / 13

Solution:

(i) 12 ÷ (6 × 2) = (12 ÷ 6) × (12 ÷ 2)

12 ÷ 12 = 2 × 6

1 ≠ 12

Hence, the statement is false

Evaluation Question

(ii) a ÷ (b – c) = a / b – a / c

a / (b – c) ≠ (ac – ab) / bc

Hence, the statement is false

(iii) (a – b) ÷ c – a / c – b / c

(a – b) / c = (a – b) / c

Hence, the statement is true

(iv) (15 – 13) ÷ 8 = (15 ÷ 8) – (13 ÷ 8)

(15 – 13) / 8 = 15 – 13 / 8

2 / 8 = 2 / 8

Hence, the statement is true.

v) 8 ÷ (15 – 13) = 8 / 15 – 8 / 13

8 / 2 = (104 – 120) / 15 (13)

4 ≠ (-16) / {15 (13)} Hence, the statement is false

(iii) and (iv) statements are true

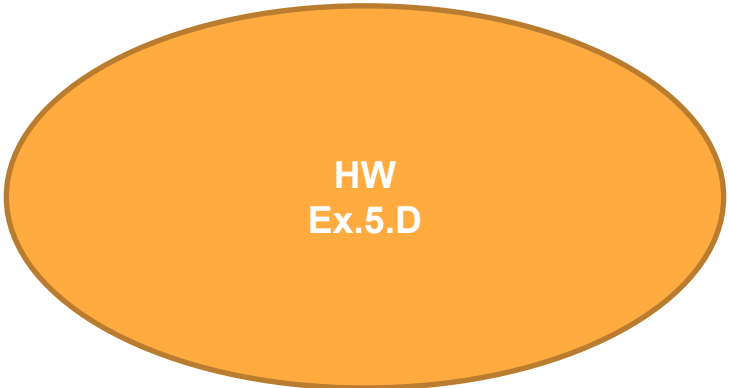
Additional Homework

1. Determine the sum of the four numbers as given below:

(a) successor of 32 (b) successor of the successor of 67

(c) Predecessor of 49 (d) predecessor of the predecessor of 56.

2. Starting from the least even natural number, state the sum of the first four even numbers.



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