Operations on Numbers

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Operations on numbers are mathematical actions that help us solve problems.

The four basic operations are:

1. **Addition** (+) – Combining numbers
2. **Subtraction** (–) – Finding the difference
3. **Multiplication** (×) – Repeated addition
4. **Division** (÷) – Splitting into equal parts

1. Addition (+)

Adding two or more numbers to find the total (sum).

Example: 15 + 8 = 23

Properties of Addition:

i. **Commutative Property:** Changing the order does not change the sum.

Example: 4 + 7 = 7 + 4

ii. **Associative Property:** Changing the grouping does not change the sum.

Example: (2 + 3) + 5 = 2 + (3 + 5)

iii. **Identity Property:** Adding 0 to any number gives the same number.

Example: 9 + 0 = 9

2. Subtraction (–)

Taking away a number from another to get the difference.

Example: 56 − 32 = 24

Properties of Subtraction:

i. **Subtraction is not commutative:** Changing the order gives a different result.

Example: 10 − 4 ≠ 4 − 10

ii. **Subtraction is not associative:** Changing the grouping gives a different answer.

Example: (20 − 5) − 3 ≠ 20 − (5 − 3)

3. Multiplication (×)

Repeated addition of a number.

Example: 6 × 4 = 24 (same as 6 + 6 + 6 + 6)

Properties of Multiplication:

i. **Commutative Property:** Changing the order does not change the product.

Example: $3 \times 5 = 5 \times 3$

ii. **Associative Property:** Changing the grouping does not change the product.

Example: $(2 \times 3) \times 4 = 2 \times (3 \times 4)$

iii. **Multiplication by 1 (Identity Property):** Any number multiplied by 1 remains the same.

Example: $7 \times 1 = 7$

iv. **Multiplication by 0:** Any number multiplied by 0 gives 0.

Example: $9 \times 0 = 0$

4. Division (÷)

Splitting a number into equal parts.

Example: $20 \div 5 = 4$

Properties of Division:

i. **Division by 1:** Any number divided by 1 remains the same.

Example: $15 \div 1 = 15$

ii. **Division by the same number:** Any number divided by itself gives 1.

Example: $12 \div 12 = 1$

iii. Division by 0 is not possible.

5. Order of Operations (BODMAS Rule)

When more than one operation is used, follow BODMAS:

- **B** – Brackets first
- **O** – Orders (Powers, Squares, etc.)
- **D** – Division
- **M** – Multiplication
- **A** – Addition
- **S** – Subtraction

Example:

Solve: $5 + 3 \times 4$

- **Multiply first:** $3 \times 4 = 12$
- **Add next:** $5 + 12 = 17$ Answer: 17