

Mathematical Operation

Arithmetical Reasoning

INTRODUCTION

In this type of problem, usually mathematical symbols are converted into another form by either interchanging the symbol or using different symbols in place of usual symbols and then calculate the equation according to the given condition.

Remember

While simplifying a mathematical problem follow 'VBODMAS' rule

V - Vinculum bracket

B - Bracket

O - Of

D - Division

M - Multiplication

A - Addition

S - Subtraction

TYPES OF MATHEMATICAL OPERATION

(i) SYMBOL SUBSTITUTION

In this, various mathematical symbols, followed by a question involving calculation of an expression. It is required to put in the real signs in the given equation and then solve the question.

EXAMPLE 1. If '+' stands for division, '×' stands for addition, '-' stands for multiplication, and '÷' stands for subtraction, then which of the following equation is correct?

- (a) $36 \times 6 + 7 \div 2 - 6 = 20$
- (b) $36 + 6 - 3 \times 5 \div 3 = 24$
- (c) $36 \div 6 + 3 \times 5 - 3 = 45$
- (d) $36 - 6 + 3 \times 5 \div 3 = 74$

Sol. $36 \times 6 \div 3 + 5 - 3$
 $\Rightarrow 36 \times 2 + 5 - 3 = 74$

(ii) INTERCHANGE OF SIGNS & NUMBERS

In this, the given equation becomes correct and fully balanced when either two signs of the equation or both the numbers and the signs of the equations are interchanged.

EXAMPLE 2. Given interchange : sign '+' and '-' and numbers 5 and 8. Which of the following is correct?

- (a) $82 - 35 + 55 = 2$
- (b) $82 - 35 + 55 = 102$
- (c) $85 - 38 + 85 = 132$
- (d) $52 - 35 + 55 = 72$

Sol. $52 + 38 - 88 = 2$

(iii) BALANCING THE EQUATION

In this, the signs given in one of the alternatives are required to fill up the blank spaces for the signs in order to balance the given equation.

» **EXAMPLE 3.** Select correct combination of mathematical sign to replace '*' sign to balance the equation.

$$9 * 4 * 22 * 14$$

(a) $\times = -$

(b) $\times - =$

(c) $= - \times$

(d) $- \times =$

Sol. $9 * 4 * 22 * 14$

$$9 \times 4 - 22 = 14$$

❑ **Shortcut Approach**

- Begin with replacing coded operators with their meanings. Write the entire expressions with correct operators and operand.
- When solving always remember VBODMAS.
- If any interchanges are suggested, apply them before you start solving.

ARITHMETICAL REASONING

Arithmetical Reasoning tests the ability to solve basic arithmetic problems encountered in everyday life. These

problems require basic mathematical skills like addition, subtraction, multiplication, division etc. The tests include operations with whole numbers, rational numbers, average ratio and proportion, interest and percentage, and measurement. Arithmetical reasoning is one factor that helps characterize mathematics comprehension, and it also assesses logical thinking.

» **EXAMPLE 4 :** The total of the ages of Amar, Akbar and Anthony is 80 years. What was the total of their ages three years ago ?

Sol. Here, required sum = $(80 - 3 \times 3)$

$$\text{years} = (80 - 9) \text{ years}$$

$$= 71 \text{ years.}$$

❑ **Shortcut Approach**

If ages of n persons in a group are $x_1, x_2, x_3, \dots, x_n$ yr, then average age of the group

$$= \frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$$

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