

Arithmetic Fundamentals

I. "3x" means 3 multiplied with 'x' (or) 'x' added three times.

II. x^3 means 'x' multiplied itself 3 times.

III Addition

$$'+' + '+' = +$$

$$'+' + '-' = - \text{ (or) } +$$

IV. Multiplication

$$+ \times + = '+'$$

$$- \times - = '+'$$

$$+ \times - = '-'$$

$$- \times + = '-'$$

V. Division

$$\frac{+}{+} = +$$

$$\frac{+}{-} = -$$

$$\frac{-}{+} = -$$

$$\frac{-}{-} = +$$

VI. $\frac{126}{7} = 18$

VII. $\frac{86}{5} = 17\frac{1}{5}$

VIII. $\frac{78}{7} = 10\frac{8}{7}$

IX. $\frac{0.2}{0.12} = \frac{0.2 \times 100}{0.2 \times 100} = \frac{5}{3}$

X. $\frac{2.4}{1.2} = \frac{2.4 \times 10}{1.2 \times 10} = \frac{24}{12} = 2$

XI. $\frac{0.25}{0.45} = \frac{25}{45} = \frac{5}{9}$

XII. $\frac{1}{0.5} = \frac{1 \times 10}{0.5 \times 10} = \frac{10}{5} = 2$

XIII. $0.33 \times 100 = 33$ (In multiplication decimal point moves right side as many zeros as in the number)

Ex: i) $1.3 \times 1000 = \xrightarrow[1300.]{3}$

ii) $0.532 \times 10000 = \xrightarrow[5320.]{4}$

XIV. $\frac{0.3}{0.42} = \frac{0.3 \times 100}{0.42 \times 100} = \frac{30}{42}$

XV. $\frac{3.2}{1000} = 0.0032$

(During division decimal point moves left as many zeros as in the denominator)

Ex :i) $\frac{1.232}{100} = 0.01232$

ii) $\frac{0.5}{1000} = 0.0005$

iii) $\frac{4}{1000} = 0.004$

XVI. $0.23 \times 0.2 = 0.046$

(first multiply $2 \times 23 = 46$ and put decimal point 3 digits towards left)

$$= 0.046$$

XVII. $\frac{2}{3} + \frac{3}{4} + \frac{1}{6}$ first calculate L.C.M of 3, 4, & 6

$$\text{L.C.M} = 2 \times 3 \times 1 \times 2 \times 1 = 12$$

$$\frac{2^4}{3} + \frac{3^3}{4} + \frac{1^2}{6} = \frac{2 \times 4 + 3 \times 3 + 1 \times 2}{12} = \frac{8 + 9 + 2}{12} = \frac{19}{12}$$

XVIII. $1\frac{1}{2} + 2\frac{1}{3} = ?$

$$(1+2) + \left(\frac{1}{2} + \frac{1}{3}\right) = 3 + \frac{3+2}{6} = 3 + \frac{5}{6} = 3\frac{5}{6}$$

XIX. $3x - 8 = 13$ then find 'x' ?

sol: $3x - 8 = 13$ $3x = 13 + 8$ $3x = 21$

$$x = \frac{21}{3} = 7$$

$$x = 7$$

XX. $2x + 8 = 14$, then a = ?

sol: $2x + 8 = 14$ $2x = 14 - 8$ $2x = 6$

$$x = \frac{6}{2} = 3$$

Rule: i) During addition (or) subtraction the sign changes if it moves from left side to other side of "="

Ex: i) $-5 + x = +1$ $x = 1 + 5$ $x = 6$

ii) $-5 + x = +1$ $-5 + x - 1 = 0$ $-6 + x = 0$ $x = +6$

iii. Multiplication of one side changes to division in other side of "="

Ex: i. $5x = 1$

$$x = \frac{1}{5} = 3$$

ii. $2x + 5 = 8$ $2x = 8 - 5$ $2x = 3$ $x = 3/2$

XXI. $5x + 8 = 3x + 10$ then $x = ?$

sol : $5x - 3x = 10 - 8$

$$2x = 2 \Rightarrow x = \frac{\cancel{2}}{\cancel{2}} = 1$$

XXII. $7x - 6 = 9x - 18$, then $x = ?$

sol : $-6 + 18 = 9x - 7x$

$$12 = 2x$$

$$2x = 12 \quad x = \frac{\cancel{12}}{\cancel{2}} = 6$$

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