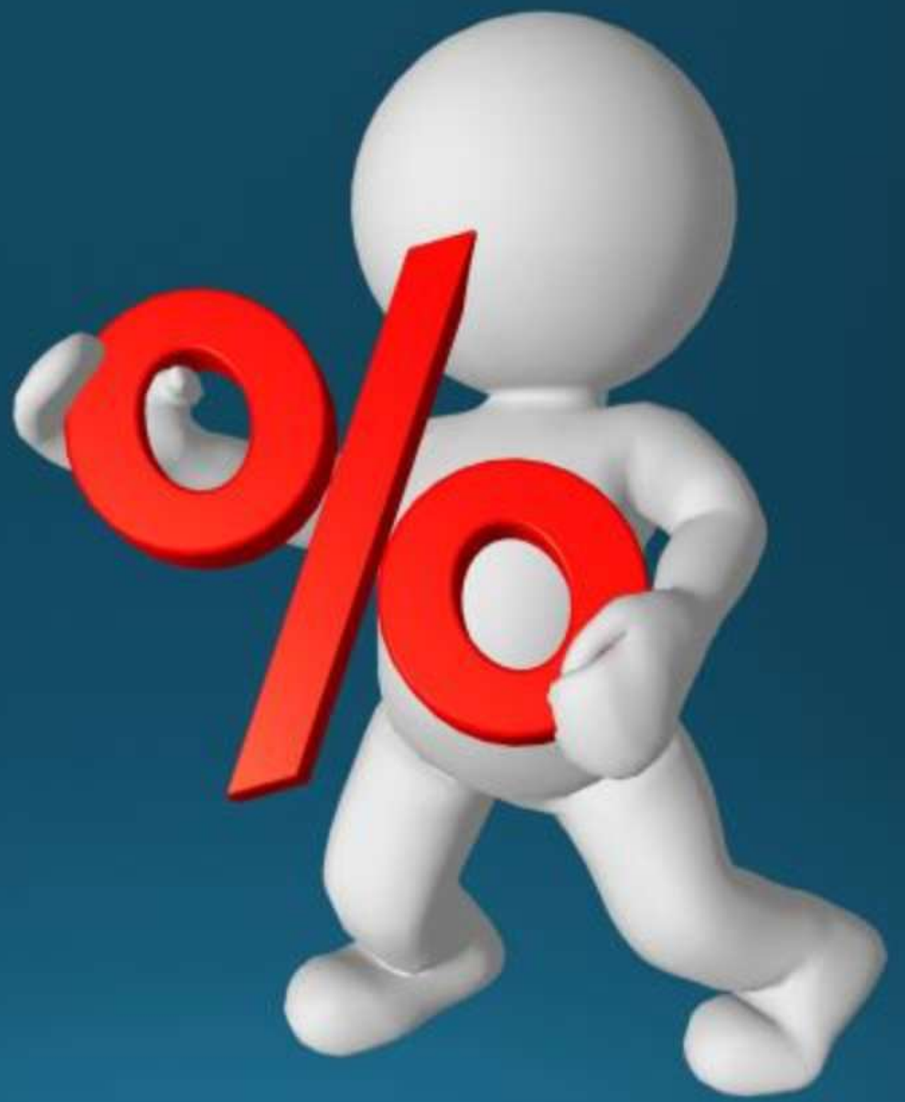
Basics of Percentage



Percentage (प्रतिशत)

आधार value = 100

Anything calculated out of 100.

Base value = 100

$$\% = \frac{1}{100}$$

Ramesh 400 / 500

$$\frac{\cancel{400}}{\cancel{500}} \times \cancel{100}^{20}\,\% = 80\,\%$$

400 ⟶ 500 ✓

80 ⟶ 100 ✓

Fractional Value ⟶ Percentage Value

भिन्न $\xrightarrow{\times 100}$ प्रतिशत

① $\frac{3}{4}$

$\frac{3}{\cancel{4}_{1}} \times \cancel{100}^{25}\% = 75\%$

② $\frac{5}{4}$

$\frac{5}{\cancel{4}_{2}} \times \cancel{100}^{25}\% = \frac{125}{2}\% = 62.5\%$

Percentage (प्रतिशत) $\xrightarrow{\div 100}$ Fraction (भिन्न)

① 25% $\frac{25}{100} = \frac{1}{4}$

② 80% $\frac{80}{100} = \frac{4}{5}$

Fractional Value → Percentage Value

$1 = 100\%$

$\frac{1}{2} = 50\%$

$\frac{1}{3} = 33\frac{1}{3}\%$

$\frac{1}{4} = 25\%$

$\frac{1}{5} = 20\%$

$\frac{1}{6} = 16\frac{2}{3}\%$

* $\frac{1}{7} = 14\frac{2}{7}\%$

$\frac{1}{8} = 12.5\%$ or $12\frac{1}{2}\%$

$\frac{1}{9} = 11\frac{1}{9}\%$

$\frac{1}{10} = 10\%$

Fractional Value → Percentage Value

* $\frac{1}{11} = 9\frac{1}{11}\%$

$\frac{1}{12} = 8\frac{1}{3}\%$

* $\frac{1}{13} = 7\frac{9}{13}\%$

$\frac{1}{14} = 7\frac{1}{7}\%$

$\frac{1}{15} = 6\frac{2}{3}\%$

$\frac{1}{16} = 6\frac{1}{4}\%$

* $\frac{1}{17} = 5\frac{15}{17}\%$

$\frac{1}{18} = 5\frac{9}{9}\%$

* $\frac{1}{19} = 5\frac{5}{19}\%$

$\frac{1}{20} = 5\%$

$20\% = \frac{1}{5}$

$40\% = \frac{2}{5}$

$60\% = \frac{3}{5}$

$80\% = \frac{4}{5}$

$33\frac{1}{3}\% = \frac{1}{3}$

$66\frac{2}{3}\% = \frac{2}{3}$

$12\frac{1}{2}\% = \frac{1}{8}$

$37\frac{1}{2}\% = \frac{3}{8}$

$62\frac{1}{2}\% = \frac{5}{8}$

$87\frac{1}{2}\% = \frac{7}{8}$

प्रतिशत परिवर्तन
(Percentage change)

① $20\% \uparrow = \frac{20}{100} = \frac{1}{5}$

- $\frac{1}{5}$ → वृद्धि / Increase
- $\frac{1}{5}$ → Old (पुरानी)

Initial / Old (पुरानी) → Final / New (नई)

100 → 120

5 : 6

(२) $25\% \uparrow = \frac{25}{100} = \frac{1}{4}$ → वृद्धि | Increase

→ old | पुराना

old +25 New

100 → 125

4 : 5

③

$15\% \downarrow = \frac{15}{100} = \frac{3}{20}$

$5\% = \frac{1}{20}$

$15\% = \frac{3}{20}$

20 : 17

④ $16\frac{2}{3}$ % of ↑ = $\overset{+}{\frac{1}{6}}$ ↻

Old		New
6	:	7

⑤ $16\frac{2}{3}$ % of ↓ = $\overset{-}{\frac{1}{6}}$ ↻

Old		New
6	:	5

(5) $66\frac{2}{3}\% \uparrow = \frac{2}{3}$

3 : 5

(7) $14\frac{2}{7}\% \uparrow = \frac{+1}{7}$

7 : 8

(6) $33\frac{1}{3}\% \downarrow = \frac{-1}{3}$

3 : 2

(8) $37.5\% \uparrow = \frac{3}{8}$

8 : 11

(9) $62.5\% \uparrow = +\frac{5}{8}$

8	:	13

(10) $7\frac{9}{13}\% \downarrow = \frac{-1}{13}$

13	:	12

Initial and Final Value/प्रारंभिक और अंतिम मूल्य

Que1: If a number is increased by 37(1/2)% then it will become 440. Find the initial number.

यदि किसी संख्या में 37(1/2)% की वृद्धि की जाए तो वह 440 हो जाएगी। आरंभिक संख्या ज्ञात कीजिए।

$37\frac{1}{2}\% \uparrow = \frac{3}{8}$

$11 \longrightarrow 440$

$1 \longrightarrow \frac{440}{11} = 40$

$8 \longrightarrow 8 \times 40 = 320$ Ans

$8 : 11$

Initial and Final Value

$14\frac{2}{7}\% = \frac{1}{7}$

$28\frac{4}{7}\% = \frac{2}{7}$

Que2: A number is decreased by 28(4/7)%. If the initial number was 840, find the new number.

एक संख्या में 28(4/7)% की कमी आई है। यदि प्रारंभिक संख्या 840 थी, तो नई संख्या ज्ञात कीजिए।

7 : 5

7 ⟶ 840

1 ⟶ $\frac{840}{7} = 120$

5 ⟶ $5 \times 120 = 600$

Ans.

Ex ①

$16\frac{2}{3}\% \uparrow = +\frac{1}{6}$ New value (नई संख्या) $= 420$

Old	:	New
6	:	7

Old value (पुरानी) $=$

$7 \longrightarrow 420$

$1 \longrightarrow \frac{420}{7} = 60$

$6 \longrightarrow 6 \times 60 = 360$

Eg ②

$12\frac{1}{2}\% \downarrow = \frac{1}{8}$

Old value (पुरानी) = 480

8 : 7

New value (नई संख्या) =

$8 \longrightarrow 480$

$1 \longrightarrow \frac{480}{8} = 60$

$7 \longrightarrow 7 \times 60$

$= 420$

Comparative Study
(तुलनात्मक)

A	B
80	120

① A, B का कितना प्रतिशत है?

A is what % of B?

$$\frac{A}{B} \times 100\%$$

$$\frac{40}{\cancel{120}_{3}} \times \cancel{100}^{5}\% = 66\frac{2}{3}\%$$

② B, A का कितना प्रतिशत है?

B is what % of A?

$$\frac{B}{A} \times 100\%$$

$$\frac{\cancel{120}^{3}}{\cancel{80}_{2}} \times \cancel{100}^{5}\% = 150\%$$

A = 80 B = 120

(3) A is what % less than (B)?
A, B से कितना % कम है?

$$\frac{B-A}{B} \times 100\%$$

$$\frac{40}{\cancel{120}_{3}} \times 100\% = 33\frac{1}{3}\%$$

(4) B is what % more than (A)?
B, A से कितना % अधिक है?

$$\frac{B-A}{A} \times 100\%$$

$$\frac{\cancel{40}^{1}}{\cancel{80}_{2}} \times \cancel{100}^{50}\%$$

$$= 50\%$$

Comparative Study/ तुलनात्मक अध्ययन

$1 = 100\%$

$\frac{1}{2} = 50\%$

$\frac{1}{3} = 33\frac{1}{3}\%$

$\frac{1}{4} = 25\%$

$\frac{1}{5} = 20\%$

Que3: A's salary is 25% more than B's salary, then find B's salary is what percentage less than A's salary.

A का वेतन B के वेतन से 25% अधिक है, तो B का वेतन A के वेतन से कितने प्रतिशत कम है?

A : B

5 : 4

$+\frac{1}{4}$ → B

A ⇄ B

25% ↑ ↓

$\frac{1}{5} \times 100\% = 20\%$ (Ans)