

# Percentages Formulae

## Percentage

### Reciprocal to percentage:

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

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

$$\frac{1}{8} = 12.5\%$$

$$\frac{1}{16} = 6.25\%$$

$$\frac{1}{3} = 33.33\%$$

$$\frac{1}{6} = 16.67\%$$

$$\frac{1}{12} = 8.33\%$$

$$\frac{1}{24} = 4.16\%$$

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

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

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

$$\frac{1}{15} = 6.67\%$$

$$\frac{1}{7} = 14.28\%$$

$$\frac{1}{14} = 7.14\%$$

$$\frac{1}{28} = 3.57\%$$

$$\frac{1}{9} = 11.11\%$$

$$\frac{1}{11} = 9.09\%$$

$$\frac{1}{18} = 5.55\%$$

$$\frac{1}{22} = 4.54\%$$

$$\frac{1}{13} = 7.69\%$$

$$\frac{1}{17} = 5.88\%$$

$$\frac{1}{19} = 5.25\%$$

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

$$\frac{1}{21} = 4.75\%$$

### Introduction to percentages:

Percentage to Fraction

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

$$35\% = \frac{35}{100} = \frac{7}{20}$$

Fraction to Percentage

$$\frac{1}{4} = \frac{1}{4} \times 100 = 25\%$$

$$\frac{7}{8} = \frac{7}{8} \times 100 = 87.5\%$$

### Percentage increase and decrease:

Fraction for Percentage Increase

Increase of 20%

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

$$\therefore \text{New value} = \left(1 + \frac{1}{5}\right) \times \text{Original Value} = \frac{6}{5} \times \text{Original Value}$$

Fraction for Percentage Decrease

Decrease of 14.28%

$$14.28\% = \frac{1}{7}$$

$$\therefore \text{New value} = \left(1 - \frac{1}{7}\right) \times \text{Original Value} = \frac{6}{7} \times \text{Original Value}$$

### Percentage Offset:

If the price of the petrol is increased by 14.28%. By how much should you reduce your consumption to keep the expenses constant?

Let Price = 1, Consumption = 1  $\Rightarrow$  Expenses = 1  $\times$  1 = 1

$$P \times C = P' \times C' \Rightarrow 1 \times 1 = \frac{8}{7} \times C'$$

$$\therefore C' = \frac{7}{8}$$

$$\text{Consumption to be reduced} = \left(1 - \frac{7}{8}\right) = 12.5\%$$

### Percentage change:

If A is 20% less than B, then B is \_\_\_\_\_% more than A.

$$A = \frac{4}{5} B \Rightarrow B = \frac{5}{4} A$$

$$\therefore B \text{ is } \left(1 + \frac{1}{4}\right) \times A$$

$$\therefore B \text{ is } \frac{1}{4} \text{ more than A.}$$

$$\therefore B \text{ is } 25\% \text{ more than A.}$$

### Successive percentage change:

If a change of a% is followed by another change of b%, then

$$\text{Net Change} = a\% + b\% + \left(\frac{ab}{100}\right)\%$$



# Gradeup Achievers' Corner



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