

Formulas and Quick Tricks for Percentage Questions

1. Percentage means per 100, i.e., $p\%$ means $p / 100$
2. To convert a fraction to a percentage, we multiply by 100 and add the “%” sign. For example, to express $1 / 5$ in percentage, we simply multiply by 100, $(1 / 5) \times 100 = 20 \%$
3. To convert a percentage to a fraction, we simply divide by 100. For example, $25 \% = 25 / 100 = 1 / 4$
4. $\text{Expenditure} = \text{Price} \times \text{Consumption}$
5. If price of an article increases by $P \%$, the necessary reduction in consumption to avoid increase in expenditure $= [(P / (100 + P)) \times 100] \%$
6. If price of an article decreases by $P \%$, the necessary increase in consumption to keep the same expenditure $= [(P / (100 - P)) \times 100] \%$
7. Population: If the population of a group/community/country/place(etc.) is currently P and if it increases by $R \%$ every year, then :
8. Population after ‘ n ’ years $= P \times [1 + (R / 100)]^n$
9. Population before ‘ n ’ years $= P / [1 + (R / 100)]^n$
10. Depreciation: If the price (or value) of an article is currently P and if it depreciates by $R \%$ every year, then:
11. Price (or value) after ‘ n ’ years $= P \times [1 - (R / 100)]^n$
12. Price (or value) before ‘ n ’ years $= P / [1 - (R / 100)]^n$
13. $x \%$ of y and $y \%$ of x is the same. For example, 10% of 100 and 100% of 10 are the same.
14. A successive increase of $a\%$ and $b\%$ is equivalent to a net increase of $a + b + ((a \times b) / 100) \%$
15. A successive decrease of $a\%$ and $b\%$ is equivalent to a net decrease of $a + b - ((a \times b) / 100) \%$
16. A successive increase of $a\%$ and decrease of $b\%$ is equivalent to a net change of $a - b + ((a \times (-b)) / 100) \% = a - b - ((a \times b) / 100) \%$
17. A successive decrease of $a\%$ and increase of $b\%$ is equivalent to a net change of $b - a + (((-a) \times b) / 100) \% = b - a - ((a \times b) / 100) \%$
18. An increase by $n \%$ and a successive decrease by $n \%$ are equal to an equivalent decrease of $(n/10)^2 \%$. For example, if the price of an article is increased by 10% , and is then successively

decreased by 10 %, then this is equal to a decrease of $(10/10)^2 = 1$ %

Note – If there is a % decrease instead of a % increase, then we take the (-) negative sign.