

Percentage Important Formulas

Understanding and memorizing key percentage formulas is essential for tackling CAT percentage questions efficiently. Here are some of the most important formulas:

- **Basic Percentage Formula:**
 $\text{Percentage} = (\text{Part} / \text{Whole}) * 100$
- **Percentage Change:**
 $\text{Percentage Change} = ((\text{New Value} - \text{Old Value}) / \text{Old Value}) * 100$
- **Percentage Increase:**
 $\text{New Value} = \text{Old Value} * (1 + \text{Percentage Increase} / 100)$
- **Percentage Decrease:**
 $\text{New Value} = \text{Old Value} * (1 - \text{Percentage Decrease} / 100)$
- **Successive Percentage Change:**
 $\text{Effective Percentage Change} = (x + y + (xy / 100)) \%$
- **Profit Percentage:**
 $\text{Profit} \% = (\text{Profit} / \text{Cost Price}) * 100$
- **Loss Percentage:**
 $\text{Loss} \% = (\text{Loss} / \text{Cost Price}) * 100$
- **Discount Percentage:**
 $\text{Discount} \% = (\text{Discount} / \text{Marked Price}) * 100$
- **Percentage of a Percentage:**
 $\text{Percentage of a Percentage} = (a / 100) * (b / 100) * 100$
- **Population Change Formula:**
 $\text{Final Population} = \text{Initial Population} * (1 + \text{Rate} / 100)^n$
where n is the number of periods.

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CAT Percentage Previous Year Questions and Answers

Type I

1.If the price of a commodity increases by 25% and the consumption decreases by 20%, what will be the effect on the expenditure?

Answer: To find the effect on expenditure, we use the successive percentage change formula: $\text{Effective Percentage Change} = 25 + (-20) + (25 * -20) / 100$. This equals $5 - 5 = 0\%$, meaning the expenditure remains unchanged.

2. A student scored 60% in an exam and failed by 20 marks. If the pass percentage is 70%, what are the maximum marks?

Answer: Let the maximum marks be x. The student scored $0.60x$ and needed $0.70x$ to pass, so:

$$\begin{aligned}0.70x - 0.60x &= 20 \\0.10x &= 20 \\x &= 200\end{aligned}$$

Thus, the maximum marks are 200.

3. The population of a town increased by 10% in the first year and decreased by 20% in the second year. What is the net percentage change in the population after two years?

Answer: Using the successive percentage change formula: Effective Percentage Change = $10 + (-20) + (10 * -20) / 100$. This equals $-10 - 2 = -12\%$, so the net change is a 12% decrease.

4. A man spends 75% of his income. If his income increases by 20% and his expenditure increases by 10%, what is the percentage increase in his savings?

Answer: Let the original income be 100, then expenditure is 75, and savings is 25.

New income = 120
New expenditure = $75 * 1.10 = 82.5$
New savings = $120 - 82.5 = 37.5$

Percentage Increase in Savings = $((37.5 - 25) / 25) * 100 = 50\%$

5. A shopkeeper marks his goods 20% above the cost price and allows a discount of 10% on the marked price. What is his gain percent?

Answer: Let the cost price be 100. The marked price is 120. After a 10% discount, the selling price is $120 * 0.90 = 108$. Thus, the gain percent is:

$$(108 - 100) / 100 * 100 = 8\%$$

Type II

6. The price of sugar is increased by 25%. By what percentage must a housewife reduce the consumption of sugar so as not to increase the expenditure?

Answer: Let the original price be 100 and the new price be 125. To maintain the same expenditure, the consumption must reduce by:

$$(125 - 100) / 125 * 100 = 20\%$$

7. A student scored 20% and failed by 30 marks. Another student scored 32% marks and got 42 marks more than the passing marks. What is the passing percentage?

Answer: Let the maximum marks be x . Passing marks = 20% of $x + 30$ and 32% of $x - 42$:

$$\begin{aligned} 0.32x - 0.20x &= 72 \\ 0.12x &= 72 \\ x &= 600 \end{aligned}$$

Marks = 20% of 600 + 30 = $120 + 30 = 150$.

Passing percentage = $(150 / 600) * 100 = 25\%$

8. If the population of a town increases by 20% annually, what will be the population after 2 years if the current population is 10,000?

Answer: After the first year, the population is $10,000 * 1.20 = 12,000$. After the second year:

$$12,000 * 1.20 = 14,400$$

The population will be 14,400.

9. A person spends 60% of his income and saves the rest. If his income increases by 25% and his expenditure increases by 15%, what is the percentage increase in his savings?

Answer: Let the original income be 100, then expenditure is 60 and savings is 40. New income = 125, new expenditure = $60 * 1.15 = 69$:

$$\text{New savings} = 125 - 69 = 56$$

$$\text{Percentage increase in savings} = ((56 - 40) / 40) * 100 = 40\%$$

Type III

10. The price of a laptop is increased by 15% and then decreased by 15%. What is the net percentage change in the price of the laptop?

Answer: Using the successive percentage change formula: $\text{Effective Percentage Change} = 15 + (-15) + (15 * -15) / 100$. This equals $0 - 2.25 = -2.25\%$, so the net change is a 2.25% decrease.

11. The salary of a person was first increased by 10% and thereafter increased by 20%. By what percentage does his salary increase overall?

Answer: Using the successive percentage change formula: $\text{Effective Percentage Change} = 10 + 20 + (10 * 20) / 100$. This equals $30 + 2 = 32\%$, so the salary increased by 32% overall.

12. A product costs \$1000 initially. If the price is increased by 10% every year, what will be the price after 2 years?

Answer: After the first year, the price is $1000 * 1.10 = 1100$. After the second year:

$$1100 * 1.10 = 1210$$

The price will be \$1210.

13. A person's salary is increased by 25% and then decreased by 20%. What is the net percentage change in his salary?

Answer: Using the successive percentage change formula: $\text{Effective Percentage Change} = 25 + (-20) + (25 * -20) / 100$. This equals $5 - 5 = 0\%$, so there is no net change in the salary.

14. If a man's income is increased by 20% and his expenditure is increased by 10%, then what is the percentage increase in his savings if initially he saves 25% of his income?

Answer: Let the original income be 100, then expenditure is 75 and savings is 25.
New income = 120, new expenditure = $75 * 1.10 = 82.5$:

New savings = $120 - 82.5 = 37.5$

Percentage increase in savings = $((37.5 - 25) / 25) * 100 = 50\%$

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CAT Expected Percentage Questions and Answers

Type I

1. The price of sugar is increased by 25%. By what percentage must a housewife reduce the consumption of sugar so as not to increase the expenditure?

- Options:** A) 10%
B) 20%
C) 25%
D) 30%

Answer: B) 20%

2. A student scored 20% and failed by 30 marks. Another student scored 32% marks and got 42 marks more than the passing marks. What is the passing percentage?

- Options:** A) 20%
B) 24%
C) 28%
D) 30%

Answer: C) 28%

3. If the population of a town increases by 20% annually, what will be the population after 2 years if the current population is 10,000?

- Options:** A) 12,000
B) 14,400
C) 15,000
D) 16,000

Answer: B) 14,400

4. A person spends 60% of his income and saves the rest. If his income increases by 25% and his expenditure increases by 15%, what is the percentage increase in his savings?

- Options:** A) 25%
B) 40%
C) 50%
D) 75%

Answer: C) 50%

5. The price of a laptop is increased by 15% and then decreased by 15%. What is the net percentage change in the price of the laptop?

- Options:** A) No change
B) 2.25% increase
C) 2.25% decrease
D) 0.75% decrease

Answer: C) 2.25% decrease

6. A company gives a 10% discount on the marked price and still makes a profit of 20%. If the cost price is \$200, what is the marked price?

- Options:** A) \$220
B) \$240
C) \$250
D) \$300

Answer: D) \$300

Type II

7. A man spends 80% of his income. His income increases by 25% and his expenditure increases by 15%. Find the percentage increase in his savings.

- Options:** A) 40%
B) 50%
C) 60%
D) 70%

Answer: D) 70%

8. A product costs \$120 after a 20% discount. What was the original price?

- Options:** A) \$140
B) \$150
C) \$160
D) \$180

Answer: C) \$150

9. If a number is increased by 25% and then decreased by 20%, what is the net change in the number?

- Options:** A) 0%
B) 2.5% increase
C) 4% increase
D) 10% increase

Answer: B) 2.5% increase

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