

PERCENTAGES

Study Materials: Key Concepts, Practice Questions, Answers

Mathema
Contest

Percentages -Study guide and Practice Questions



Name: _____

Key Concepts

1. **Understanding Percentages:** A percentage is a fraction of 100. It is denoted using the symbol "%".
 - For example, 50% means 50 out of 100, or $50/100$.
2. **Converting Between Percentages, Fractions, and Decimals:**
 - To convert a percentage to a decimal, divide by 100. (e.g., $75\% = 75/100 = 0.75$)
 - To convert a decimal to a percentage, multiply by 100. (e.g., $0.85 = 0.85 * 100 = 85\%$)
 - To convert a percentage to a fraction, place the percentage over 100 and simplify. (e.g., $25\% = 25/100 = 1/4$)
3. **Calculating Percentage of a Number:**
 - Formula: $(\text{Percentage} \times \text{Whole}) / 100$
 - Example: What is 20% of 50? $(20 \times 50) / 100 = 10$
4. **Finding the Percentage:**
 - Formula: $(\text{Part} / \text{Whole}) \times 100$
 - Example: What percentage is 25 of 200? $(25 / 200) \times 100 = 12.5\%$
5. **Increasing/Decreasing a Number by a Percentage:**
 - Increase: $\text{New Value} = \text{Original Value} \times (1 + \text{Percentage}/100)$
 - Decrease: $\text{New Value} = \text{Original Value} \times (1 - \text{Percentage}/100)$
 - Example: Increase 150 by 20%: $150 \times (1 + 20/100) = 150 \times 1.20 = 180$
 - Example: Decrease 200 by 15%: $200 \times (1 - 15/100) = 200 \times 0.85 = 170$

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Practice Questions

1. Convert 45% to a decimal.
2. Convert 0.62 to a percentage.
3. Convert 75% to a fraction in simplest form.
4. What is 30% of 80?
5. If 15 is 25% of a number, what is the number?
6. A jacket is originally priced at \$120. It is on sale for 25% off. What is the sale price?
7. The population of a town increased from 20,000 to 24,000. What is the percentage increase?
8. Find the percentage decrease if a car's value goes from \$15,000 to \$12,000.
9. A student scored 84 marks out of 120 in an exam. What percentage did the student score?
10. A product costs \$50 after a 20% discount. What was the original price?

Answers

1. Convert 45% to a decimal.
 - Answer: 0.45
2. Convert 0.62 to a percentage.
 - Answer: 62%
3. Convert 75% to a fraction in simplest form.
 - Answer: $\frac{3}{4}$
4. What is 30% of 80?

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- Calculation: $(30 \times 80) / 100 = 24$

- Answer: 24

5. If 15 is 25% of a number, what is the number?

- Calculation: $15 = (25/100) \times \text{Number} \rightarrow \text{Number} = 15 / (25/100) = 15 \times 4 = 60$

- Answer: 60

6. A jacket is originally priced at \$120. It is on sale for 25% off. What is the sale price?

- Calculation: $\text{Sale Price} = 120 \times (1 - 25/100) = 120 \times 0.75 = \$90$

- Answer: \$90

7. The population of a town increased from 20,000 to 24,000. What is the percentage increase?

- Calculation: $\text{Increase} = 24,000 - 20,000 = 4,000$

- $\text{Percentage Increase} = (4,000 / 20,000) \times 100 = 20\%$

- Answer: 20%

8. Find the percentage decrease if a car's value goes from \$15,000 to \$12,000.

- Calculation: $\text{Decrease} = 15,000 - 12,000 = 3,000$

- $\text{Percentage Decrease} = (3,000 / 15,000) \times 100 = 20\%$

- Answer: 20%

9. A student scored 84 marks out of 120 in an exam. What percentage did the student score?

- Calculation: $(84 / 120) \times 100 = 70\%$

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- Answer: 70%

10. A product costs \$50 after a 20% discount. What was the original price?

- Calculation: $50 = \text{Original Price} \times (1 - 20/100) \rightarrow 50 = \text{Original Price} \times 0.80 \rightarrow \text{Original Price} = 50 / 0.80 = \$62.50$
- Answer: \$62.50