05 - Standardized Proportions

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Maryville College

Outline

1. Percentage Terms and Notation
2. Percentage Calculations
3. Percentage and Proportion Problems

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1 Percentage Terms and Notation

2 Percentage Calculations

3 Percentage and Proportion Problems

Terms

$$\text{percentage} : \text{base} :: \text{rate} : 100$$

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- The **base** is the number on which the percentage is computed. (This can often be thought of as the total amount, original amount, or total population in most problems.)
- The **rate**, also referred to as the percent, is the parts out of 100 to be taken from the base.

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- **Amount** is the sum obtained by adding the percentage to the base.
- **Difference** is the remainder obtained by subtracting the percentage from the base.

Notation

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- A fraction $\frac{25}{100}$ or $\frac{1}{4}$
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- Using the % sign 25%

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$$\text{is} : \text{of} :: \text{percent} : 100$$

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- We could rewrite the fraction’s proportion as the following mnemonic

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- Exercise: Rewrite this mnemonic proportion in fraction form.

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   3. $400x = 5000$
   4. $x = 12.5\%$

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In problems dealing with amounts and differences, the base and percentage are used in the sum or difference.

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   5. $10x = 5 \times 100$
   6. $10x = 500$
   7. $x = 50\%$

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    2. $x : 3.28 \times 10^8 :: 0.71 : 100$

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    5. $x = 2.33 \times 10^6$

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    3. $100x = 3.28 \times 10^8 \times 0.71$
    4. $100x = 2.33 \times 10^8$
    5. $x = 2.33 \times 10^6$
    6. $\text{amount} = 3.28 \times 10^8 + 2.33 \times 10^6$
    7. $\text{amount} = 3.30 \times 10^8$

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Problem 2

If 8 workers in 24 days working 10 hours a day can reap 48 acres of wheat, how many acres could 12 workers reap in 20 days of 12 hours each?

Problem 3

If a staff of 4ft casts a shadow 7ft in length, what is the height of a tower which casts a shadow of 198ft at the same time?

Problem 4

A homeowner sells their house at a loss of 20%. If the selling price was $\$60,000.00$, what was the original price of the home?

Problem 5

In the erection of a house I paid twice as much for material as for labor. Had I paid 6% more for material, and 9% more for labor, my house would have cost $1284.00; what was its cost?