Section 2

Basic Percents

Basic Percents are word problems where you are asked to find a number or a percent. These word problems are very basic when it comes to translating English Language into Math Language.

· **Direct Translation Words For Basic Percents: *Is, Of***

When translating from English to Math with Basic Percent word problems, the words "**is**" and "**of**" translate directly into math symbols. These symbols help to make up your math equation. As mentioned in Section 1, "**is**" translates into "**equals**." The word "**of**" translates into multiplication.

> (Note: It is recommended that you use the times sign (×) to indicate multiplication. With Basic Percent word problems you will almost always be working with decimals. So you want to avoid confusing the decimal point with the multiplication dot.)

Direct Translation Words	What They Mean	Symbol Used
Is	Is equal to	=
Of	Multiply	×

TRANSLATION EXAMPLES

English: 14 is what percent of 80?
Math: 14 = what percent × 80?

English: What is 5% of 24?
Math: What = 5% × 24? *?*

· **Direct Translation Word: *What***

In Basic Percent word problems, the word "**what**" will either be accompanied by the word "**number**" or the word "**percent**". It doesn't matter with which word "**what**" is partnered. "**What**" always represents an unknown, and is therefore replaced with a variable, such as *n*.

· Solving the Problem: *Set Up And Solve The Equation, Answer The Question Asked*

The following steps will help you solve Basic Percent word problems:

Step 1
Set Up The Equation Using Direct Translation

When setting up an equation for a Basic Percent word problem, translate the English sentence in order from left to right.

- When you see the word "**is**", replace it with an **equal sign**.
- When you see the word "**of**", replace it with a **times sign**.
- When you see the words "**what number/percent**", replace them with a **variable**.
- If you see a number, just re-write the number in your Math equation.

(Note: You must change a percent to a decimal or fraction before writing it in your equation. In this chapter, all percents will be changed to decimals. For example, "**20%**" would be changed to "**0.20**" or "**0.2"**.)

Step 2
Solve The Equation

Using the problem solving method taught by your instructor, solve the equation for the variable.

(Note: If necessary, you may want to simplify the appearance of the equation to a more familiar format. For example, if your equation states "***n* x 15**", it would probably be more familiar and recognizable to you to change it to "**15*n***".)

Step 3
Make Sure You Answer The Question Asked

Once you solve the equation, you will find the value for the variable "*n*", but that might not be the answer to the question. In Basic Percent word problems, the question will ask:

"What?"
"What number?"
"What percent?"

If the questions asks "What" or "What number," the value of *n* is your final answer and you are done with the problem.

But if the questions asks for "What Percent", then the value of *n* is NOT the correct answer. You must change the value of *n* into a percent in order to have the correct answer.

EXAMPLES

EXAMPLE 1 What is 18% of 84?

SOLUTION

Step 1 *Set Up The Equation*

- Translate in order from left to right.
- "What " becomes a variable. "Is" becomes an equal sign. "Of" becomes a Times sign.
- Change 18% percent into a decimal.

$$n = 0.18 \times 84$$

Step 2 *Solve The Equation*

- In this example, the equation is already in a familiar form.
- Since the variable, n, is already by itself, there is no need to solve for n.
- To get the answer to your equation, multiply 0.18 x 84.

$$n = 15.12$$

Step 3 *Answer The Question Asked*

- The question asks "What", so the value of n IS your final answer and you are done.

Answer: 15.12

EXAMPLE 2 51 is 5% of what number?

SOLUTION

Step 1 *Set Up The Equation*

- Translate in order from left to right.
- Change the Basic Percent Translations Words into their symbols.
- "Is" translates to "=". "Of" translates to Times sign. "What number" is the variable .
- Change 5% percent into a decimal.

$$51 = 0.05 \times n$$

Step 2 *Solve The Equation*

- You may want the equation in a more familiar form. Change "$0.05 \times n$" to "$0.05n$".
- If you prefer the variable to the left of the equal sign, it's okay to switch the expressions.
- Using the method taught by your instructor, solve the equation for n.

$$51 = 0.05n$$
$$0.05n = 51$$
$$n = 1020$$

Step 3 *Answer The Question Asked*

- The questions asks "What number", so the value of n IS your final answer and you are done.

Answer: 1020

EXAMPLE 3 25 is what percent of 200?

SOLUTION

Step 1 *Set Up The Equation*

- Translate in order from left to right.
- Change the Basic Percent Translations Words into their symbols.
- "Is" translates to "=". "What percent" is the variable. "Of" translates to the Times sign.

$$25 = n \times 200$$

Step 2 *Solve The Equation*

- You may want the equation in a more familiar form. Change "n x 200" to "200n".
- If you prefer the variable to the left of the equal sign, it's okay to switch the expressions.
- Using the method taught by your instructor, solve the equation for n.

$$25 = 200n$$
$$200n = 25$$
$$n = \frac{1}{8} \text{ or } 0.125$$

Step 3 *Answer The Question Asked*

- The questions asks "What percent", so the value of n as given is NOT your final answer.
- Change the value of n to a percent to get the correct answer.

Answer: 12.5%

Basic Percents: Exercise Set

1. What is 5% of 80?
2. What is 20% of 150?
3. 21 is 3% of what number?
4. 3 is 15% of what number?
5. 40 is what percent of 200?
6. 16 is what percent of 120?
7. What is 16% of 75?
8. What is 8% of 275?
9. 18 is 30% of what number?
10. 4 is 5% of what number?
11. 11 is what percent of 50?
12. 100 is what percent of 300?
13. What is 6.5% of 74?
14. What is 21.4% of 85?
15. 12 is 120% of what number?
16. 5 is 200% of what number?
17. 75 is what percent of 15?
18. 84 is what percent of 21?
19. What is 120% of 15?
20. What is 220% of 3?