Objectives

- Convert between decimal notation and percent notation.
- Solve problems involving percent.

Definition 1. *Percent means **per one hundred***. *We use % to denote percent.*

For instance, 23% means 23 per 100, 23% is the ratio of 23 to 100, or $\frac{23}{100}$.

Also, $1\% = \frac{1}{100} = 0.01$; and $100\% = \frac{100}{100} = 1$.

Write Percents as Decimals
To write a percent as a decimal, replace the % symbol with its decimal equivalent, 0.01; then multiply. This is equivalent to removing the % symbol and moving the decimal point of the number left of the % *two places to the left*.

---

1.   **Write each percent as a decimal.**

 a)   39%   b)   100%   c)   3.14%   d)   2.7%   e)   0.74%

Converting Decimals to Percents
To write a decimal as a percent, multiply by 100%. This is equivalent to moving the decimal point 2 places to the right and attaching a % symbol.

---

2.   *Write each decimal as a percent.*

 a)   0.52   b)   0.017   c)   0.73   d)   1.20   e)   0.2344

Recognizing key words in a percent problem is helpful in writing the problem as an equation. Three key words in the statement of a percent problem and their meanings are:

     of means **multiplication** (·)
     is means **equal** (=)
     what (or some equivalent) means **the unknown number**

Example 1: Translate this phrase to an equation: 3 is what percent of 12?

Solution: 3 is what percent of 12?

$$3 = \quad x \quad \cdot \ 12$$

Example 2: Translate this phrase to an equation: 3.2 is 60% of what number?

Solution: 3.2 is 60% of what number?

$$3.2 = 60\% \cdot \quad x$$

Example 3: Translate this phrase to an equation: What number is 20% of 0.07

Solution: What number is 20% of 0.07?

$$x \quad = 20\% \cdot \ 0.07$$

---

3.   **Set up an equation and solve for the unknown.**

   a)   What number is 25% of 90?

   b)   95% of 400 is what number?

   c)   63 is what percent of 45?

   d)   0.5% of 100 is what number?

   e)   150% of what number is 60?

   f)   3.2 is what percent of 128?

   g)   0.50 is what percent of 4.50?

4.   During one year, Sashy's city tax included $487 for local schools. Of this amount, $195 went to the high school district. What percent did Sashy pay to the high school district? (Round your answer to the nearest whole number percent.)

5.   If Gloria received a 5 percent raise and is now making $22,050 a year, what was her salary before the raise? Round to the nearest dollar if necessary.

6.   It is Selena's turn to leave the tip at a business dinner that cost $287.60. If she tips 20% of that, how much of a tip did she leave?

Answers: 1a) 0.39, b) 1, c) 0.0314, d) 0.027, e) 0.0074, 2a) 52%, b) 1.7%, c) 73% d) 120%, e) 23.44%, 3a) 22.5 b) 380, c) 140%, d) 5, e) 40, f) 2.5 4) 40%, 5) $21,000, 6) $57.52