

## 2.2.7: Percents Part 1

### Percent Basics

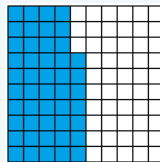
Percent means “per one hundred”. A percent is a ratio or fraction with a denominator of 100.

#### ? Exercises 2.2.7.1



During Super Bowl XLIX between the Seahawks and Patriots, 89 out of 100 television sets in Seattle were tuned to the game.  
[1]

1. What percent of the television sets were tuned to the game?
2. What percent of the television sets were not tuned to the game?



3. What percent of the squares are shaded?
4. What percent of the squares are not shaded?

#### Answer

1. 89%
2. 11%
3. 89%
4. 11%

To write a percent as a fraction: drop the percent sign, write the number over 100, and simplify if possible.

Tip: If a percent is greater than 100%, the fraction will be greater than 1. If a percent is less than 1%, the fraction will be less than  $\frac{1}{100}$ .

#### ? Exercises 2.2.7.1

Write each percent as a fraction, and simplify if possible.

5. About 71% of Earth’s surface is covered by water.<sup>[2]</sup>
6. About 1.3% of Earth’s land surface is permanent cropland.<sup>[3]</sup>
7. About 0.04% of Earth’s atmosphere is carbon dioxide.<sup>[4]</sup>
8. The worldwide number of active Facebook users in the fourth quarter of 2018 was approximately 102% of the number of users in the third quarter of 2018.<sup>[5]</sup>

#### Answer

5.  $\frac{71}{100}$
6.  $\frac{1.3}{100} = \frac{13}{1000}$
7.  $\frac{0.04}{100} = \frac{1}{2500}$
8.  $\frac{102}{100} = \frac{51}{50}$

To write a percent as a decimal: drop the percent sign and move the decimal point two places to the left.

#### ? Exercises 2.2.7.1

Write each percent from Exercises 5 through 8 as a decimal.

9. 71%
10. 1.3%
11. 0.04%
12. 102%

#### Answer

9. 0.71
10. 0.013
11. 0.0004
12. 1.02

To write a decimal as a percent: move the decimal point two places to the right and insert a percent sign.

#### ? Exercises 2.2.7.1

Write each decimal number as a percent.

13. 0.23
14. 0.07
15. 0.085
16. 2.5

#### Answer

13. 23%
14. 7%
15. 8.5%
16. 250%

To write a fraction as a percent, write the fraction as a decimal by dividing the numerator by the denominator, then move the decimal point two places to the right and insert a percent sign.

Alternate method: Recall from the fractions module that if the denominator of a fraction has no prime factors other than 2's and 5's, then the fraction can be built up to have a denominator of 10, or 100, or 1,000...

### ? Exercises 2.2.7.1

17. 7 out of 25 students were tardy on Wednesday. Write  $\frac{7}{25}$  as a percent.

18. A package of 24 m&m's contained 3 orange m&m's. Write  $\frac{3}{24}$  as a percent.

#### Answer

17. 28%

18. 12.5%

## Solving Percent Problems: Finding the Amount

**You may use a calculator throughout the remainder of this module.**

We often use the words **amount** and **base** in a percent problem. The **amount** is the answer we get after finding the percent of the original number. The **base** is the original number, the number we find the percent of. (You may also think of the amount as the part, and the base as the whole.) We can call the percent the **rate**.

$$\text{Amount} = \text{Rate} \cdot \text{Base}$$

$$A = R \cdot B$$

Be sure to change the percent to a decimal before multiplying.

### ? Exercises 2.2.7.1

19. What is 9% of 350?

20. 30% of 75 is what number?

21. Find 13.5% of 500.

22. 125% of 80 is equal to what amount?

23. What number is 40% of 96.5?

24. Calculate 0.5% of 450.

Suppose you buy an electric drill with a retail price of \$ 109.97 in a city with 8.5% sales tax.

25. Find the amount of the tax. Round to the nearest cent, if necessary.

26. How much do you pay in total?

#### Answer

19. 31.5

20. 22.5

21. 67.5

22. 100

23. 38.6

24. 2.25

25. \$ 9.35

26. \$ 119.32

1. <https://twitter.com/darrenrovell/status/562258101337067521> ↩

2. <https://en.Wikipedia.org/wiki/Earth#Surface> ↩

3. <https://en.Wikipedia.org/wiki/Earth#Surface> ↵
4. [https://en.Wikipedia.org/wiki/Atmosphere\\_of\\_Earth#Composition](https://en.Wikipedia.org/wiki/Atmosphere_of_Earth#Composition) ↵
5. <https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/> ↵

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