

KEY CONCEPT OVERVIEW

Students' knowledge of percents continues to build throughout Topic B. Students apply their knowledge to a variety of real-world situations as they complete problems involving **markups**, **markdowns**, taxes, **commissions**, fees, **simple interest**, and other real-world concepts. In this topic, students are also introduced to problems involving **absolute error** and **percent error**.

You can expect to see homework that asks your child to do the following:

- Calculate the original price or the sale price after markups and/or markdowns.
- Determine the percent error.
- Solve one-step percent problems.
- Solve percent problems in which the whole changes in the context of the problem.
- Use the simple interest formula to calculate the amount of interest.
- Solve multi-step real-world percent problems.

SAMPLE PROBLEMS (From Lessons 7–8)

1. Sasha went shopping and decided to purchase a set of bracelets offered at 25% off the regular price. If Sasha buys the bracelets today, she will save an additional 5%. Find the sale price of the set of bracelets with both discounts. How much money will Sasha save if she buys the bracelets today?

Let B be the sale price with both discounts, in dollars.

$$B = (0.95)(0.75)(44) = 31.35$$
$$44 - 31.35 = 12.65$$



The sale price of the set of bracelets with both discounts is \$31.35. Sasha will save \$12.65.

2. Calculate the percent error.

A real estate agent expected 18 people to show up for an open house, but 25 attended.

$$\frac{|18 - 25|}{|25|} \times 100\% = 28\%$$

The percent error is 28%.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

You can help at home in many ways. Here are some tips to help you get started.

- With your child, discuss a variety of real-world percent problems and what they mean. For example, “If a shirt is on sale for 25% off, and I can save an additional 15% with a coupon, do I really save 40%?”
- Examine ads in a newspaper or online, and have your child calculate the sale price after saving the percentage of the price presented in the ad. To extend this exercise, you might ask your child to calculate the total sale price if there is also 7.5% tax.
- In preparation for Topic C, have a discussion about scale factor (introduced in Module 1) to review an important term for this topic. Determining whether a scale factor results in an enlargement or a reduction and how to find the dimensions of a scale drawing when given a scale factor are important for the work of this topic.

TERMS

Absolute error: Given the exact value, x , of a quantity and an approximate value, a , of the quantity, the absolute error is $|a - x|$. For example, a television screen is 15 inches long (exact value). However, when a student measures the screen, he measures $15\frac{1}{8}$ inches long (approximate value). The absolute error is the absolute value of the difference between the actual measurement and the student’s measurement, or $\left|15\frac{1}{8} - 15\right| = \frac{1}{8}$.

Commission: A fee earned for making a sale or performing a service. Typically, the commission represents a specific percentage of the price of the item(s) sold.

Gratuity: Another word for *tip*. It is an amount of money given to someone for performing a service. Typically, the gratuity is calculated as a percentage of the bill for the service.

Markdown: A reduction in price, or the amount by which a price is reduced/decreased.

Markdown rate: Also called the discount rate. It is the specific percentage by which a price is decreased.

Markup: An increase in price, or the amount by which a price is increased. Typically, the term refers to the increase in price from wholesale (cost) to retail (selling price).

Markup rate: The specific percentage by which an original price is increased.

Percent error: The difference between an exact value and an approximate value, represented as a percentage of the exact value. Using the same television example from the definition of *absolute error*, we can calculate the percent error as $\frac{\left|15\frac{1}{8} - 15\right|}{|15|} \times 100\% \approx 0.83\%$, which means that the student’s measurement has a percent error of approximately 0.83%.

Simple interest: A value based on a percentage of the total that is calculated and added only one time to the base amount. The formula for simple interest is $I = prt$, where I represents interest, p represents principle, r represents rate, and t represents time.