

Grade 7 - Percent Problems: Tax, Tips, Discounts and Markups - Lesson

Common Core 7.RP.A.3 · maths-pdf.fr/en/

A percent is a rate per 100, so you find a percent of a quantity by multiplying by its decimal form. Tax, tips, and markups add a percent of the base amount, while discounts subtract it. Percent change compares the change to the original amount, so a 20% rise followed by a 20% drop does not return to the start.

Grade 7 · Common Core State Standards: **7.RP.A.3**

Key facts

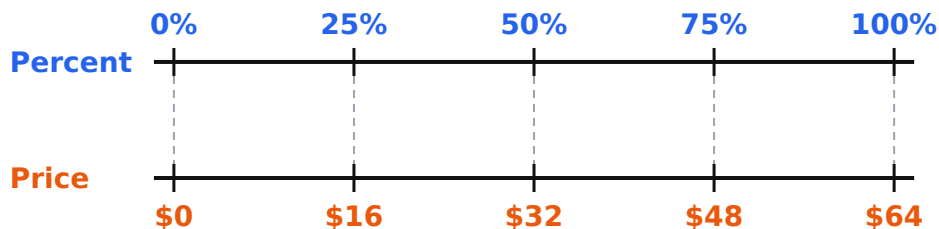
- Percent of a number: change the percent to a decimal and multiply.
- Tax, tips, and markups add; discounts subtract. The base is the original amount.
- Percent change = $\text{change} \div \text{original amount} \times 100\%$.
- Simple interest is $I = prt$; commission is a percent of sales.
- Percent error = $|\text{measured} - \text{actual}| \div \text{actual} \times 100\%$.

What is a percent of a number?

A **percent** is a rate per 100. To find a percent of a number, write the percent as a decimal and multiply. For example, $35\% \text{ of } 60 = 0.35 \times 60 = 21$.

Percent change

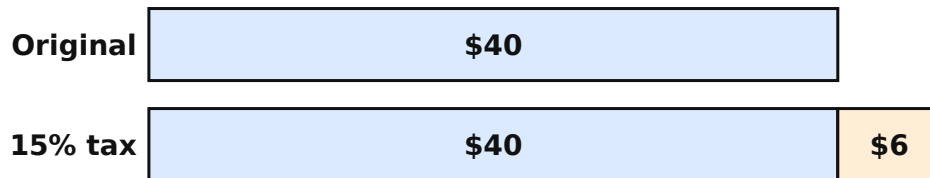
$\text{percent change} = (\text{amount of change} \div \text{original amount}) \times 100\%$. The change is found by subtracting; the **original** amount is always the starting value.



A 25% discount on a \$64 jacket takes off \$16, leaving \$48.

How do you find tax, tips, markups and discounts?

Tax, tips, and markups **add** a percent of the base amount. Discounts and markdowns **subtract** a percent of the base amount.

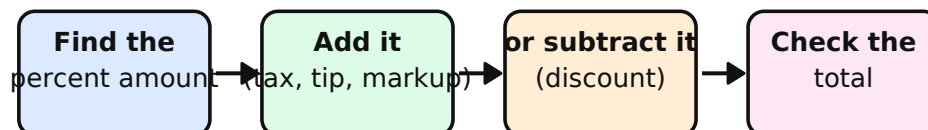


Tax is extra: the bar grows by 15% of the original amount.

Situation	Base amount	Final amount
Sales tax or tip	Price or bill	base + percent of base
Markup	Cost to the store	cost + percent of cost
Discount	Original price	original - percent of original
Commission	Total sales	percent of sales (plus any base pay)

You can also use one step with a multiplier. A 7% tax means the total is 107% of the price, so multiply by 1.07. A 25% discount leaves 75%, so multiply by 0.75.

How do you solve a multistep percent problem?



Most percent problems use the same four steps.

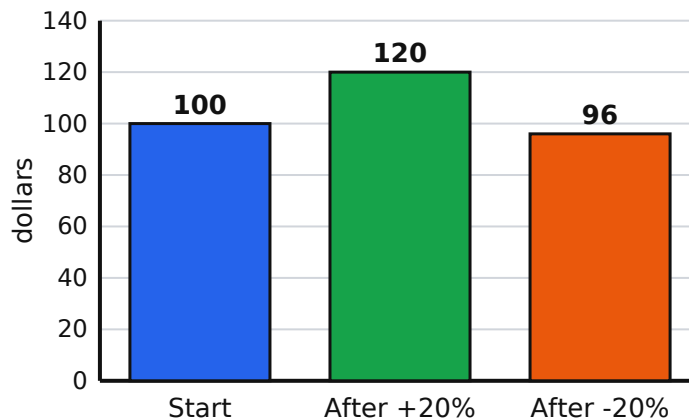
1. Identify the base amount (the 100%).
2. Convert the percent to a decimal.
3. Multiply to find the percent amount.
4. Add or subtract as the story says.

Example. Maya buys a \$48 soccer ball at 15% off, then pays 6% tax. Discount: $0.15 \times 48 = 7.20$, so the sale price is \$40.80. Tax: $0.06 \times 40.80 = 2.448$, about \$2.45. Total: \$43.25.

What are simple interest and percent error?

Simple interest is $I = prt$, where p is the principal, r is the yearly rate as a decimal, and t is the time in years. Percent error compares a measurement to the true value:

$$\text{percent error} = (|\text{measured} - \text{actual}| \div \text{actual}) \times 100\%.$$



A 20% rise followed by a 20% drop does not return to \$100, because the second percent is taken of a larger amount.

Questions about percent problems: tax, tips, discounts and markups

How do you find a percent of a number?

Write the percent as a decimal by dividing by 100, then multiply. For 35% of 60, compute $0.35 \times 60 = 21$.

How do you find the sale price after a discount?

Multiply the original price by the percent of the discount to find the amount saved, and subtract it. Or multiply by the percent that remains: a 25% discount means multiply by 0.75.

What is the difference between markup and discount?

A markup is added to the store's cost to set the selling price. A discount is subtracted from the selling price to get a sale price.

How do you find percent increase?

Subtract the old value from the new value, divide by the old value, and multiply by 100. Going from 40 to 50 is a 25% increase because $10 \div 40 = 0.25$.

How is simple interest calculated?

Use $I = prt$. For \$800 at 3% for 4 years, $I = 800 \times 0.03 \times 4 = \$96$.