FIBO / MATH / ELEMENTARY · UNIT 3 · DECIMALS & PERCENTS

Percent Applications: Discount, Tax, Tip — Lecture

Almost every number that touches your wallet is a percent. A discount subtracts a percent of the price, sales tax and tips add one, percent change compares new to old, and simple interest grows money over time.

BY THE END OF THIS LESSON, YOU WILL BE ABLE TO

- ✓ Compute discounts and sale prices — subtracting the percent, or paying the rest
- ✓ Add sales tax and tips to a bill correctly
- ✓ Find percent change with change ÷ original
- ✓ Compute simple interest with P × r × t

⏱ About 30 min · Needs: percent of a number · Unit 3 · Decimals & Percents

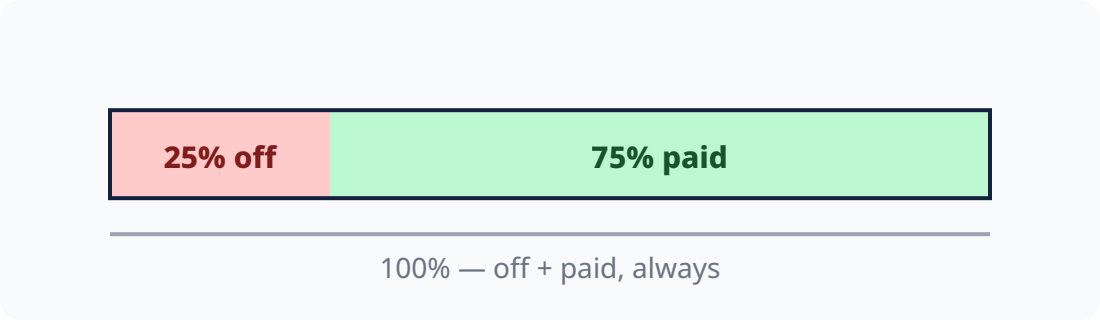
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Printable companion to the interactive lesson at fibotutors.com — full color. Worked examples and application solutions are shown in full; Try-It answers live in the separate Answer Key.

CONCEPTS

The Big Picture

The four jobs percents do in real life: a **discount** subtracts a percent of the price, **sales tax** and **tips** add one, **percent change** compares a new value to the old one, and **simple interest** grows money over time. Same percent engine underneath each one.



25% off + 75% paid = 100% — always. Find one side, and you know the other.

Every problem below is two steps: **find the percent amount** (the engine from last lesson), then **add or subtract it** — except percent change and interest, which have their own one-line formulas.

Discount: discount = percent × price; sale price = price − discount. Shortcut: pay (100% − p)% directly — 25% off means pay 75%: 0.75 × 80 = $60.

Tax and tip: amount = percent × bill; total = bill + amount. $45 meal, 8% tax: tax = 0.08 × 45 = $3.60, total $48.60.



Percent change = (change ÷ original) × 100%. Change = new − old. The original — where you started — is always the denominator.

Simple interest: I = P × r × t (principal × rate × time). $200 at 5% for 3 years: I = 200 × 0.05 × 3 = $30; total $230.

REAL LIFE FIRST

Math in the Wild

REAL LIFE FIRST

📷 Picture this: a Black Friday sale tag on a jacket showing 25% off



Reading a sale tag, splitting a restaurant bill, or checking whether a "50% bigger!" claim is honest — all four moves, every day.

Where you already meet percent applications: sale prices and coupons, restaurant tips, sales tax, investment growth, and test-score improvements.

WORKED EXAMPLES

See Every Step

Example 1 — Discount: $80 jacket, 25% off

Step 1 Discount = percent × price = 0.25 × 80 = **$20.00**.

Step 2 Sale price = 80 − 20 = **$60.00**.

Step 3 Shortcut check: pay 75% → 0.75 × 80 = $60 ✓.

Sale price = $60.00

→ "25% off" and "pay 75%" are the same question — off + paid = 100%.

✏️ Workspace — rework this example

✏️ Try It 1 — your turn

A **$50** shirt is **20% off**. What is the sale price?

(Answer in the separate Answer Key — try it on your own first!)

✏️ Workspace — solve the Try-It here

Example 2 — Sales tax: $45 meal, 8% tax

Step 1 Tax = 0.08 × 45 = **$3.60**.

Step 2 Total = 45 + 3.60 = **$48.60**.

Step 3 Check: 8% of ~$45 ≈ $3.60 — the total is sensibly just above $45 ✓.

Total = $48.60

➜ Tax is charged on what you actually pay — the sale price, never the crossed-out sticker price.

✏️ Workspace — rework this example

✏️ Try It 2 — your turn

A **$30** item has **10%** sales tax. What is the total?

(Answer in the separate Answer Key — try it on your own first!)

✏️ Workspace — solve the Try-It here

Example 3 — Percent change: price rises from $50 to $65

Step 1 Change = new − old = 65 − 50 = **$15**.

Step 2 Percent change = change ÷ **original** = 15 ÷ 50 = 0.30.

Step 3 0.30 = **30% increase**.

30% increase

→ **Check:** 30% of $50 = $15, and $50 + $15 = $65 ✓. Always divide by the original.

✏️ Workspace — rework this example

✏️ Try It 3 — your turn

A price rises from **$20** to **$25**. What is the percent increase?

(Answer in the separate Answer Key — try it on your own first!)

✏️ Workspace — solve the Try-It here

Example 4 — Tip: $60 bill, 15% tip

Step 1 Tip = 0.15 × 60 = **$9.00**.

Step 2 Total = 60 + 9 = **$69.00**.

Step 3 Check: 10% ($6) + 5% ($3) = $9 ✓.

Tip $9.00, total $69.00

➜ The 10% + 5% split is the fastest mental-tip trick — no calculator, no converting.

✏️ Workspace — rework this example

✏️ Try It 4 — your turn

A **$80** bill gets a **20% tip**. Tip and total?

(Answer in the separate Answer Key — try it on your own first!)

✏️ Workspace — solve the Try-It here

USE IT FOR REAL

Application Problems

USE IT FOR REAL

App 1 — Discount + tax combo

The $80 jacket is 25% off, and the store charges 8% sales tax. What do you actually pay?

Jacket	$80.00
Discount 25%	−$20.00
Sale price	**$60.00**
Tax 8%	$4.80
TOTAL	**$64.80**

Tax is charged on the $60 sale price — not the $80 sticker. Tax = 0.08 × 60 = $4.80.

Solution. Discount first: 0.25 × 80 = $20 → sale price $60.
Tax goes on the sale price: 0.08 × 60 = $4.80.
Total = 60 + 4.80 = **$64.80**. (Taxing the $80 sticker would wrongly give $6.40.)

✏️ Workspace — solve it your way first, then compare

App 2 — Simple interest

You deposit **$200** in a savings account earning **5%** simple interest per year. How much interest in **3** years — and what is the total?



I = P × r × t = 200 × 0.05 × 3

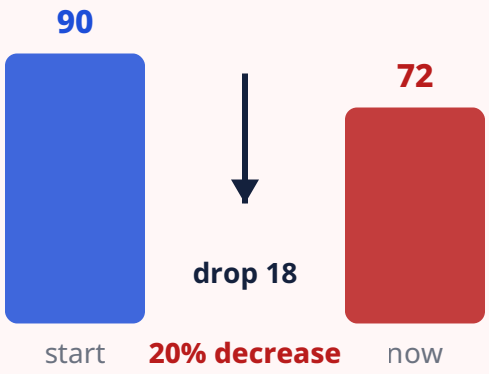
I = P × r × t = 200 × 0.05 × 3 = $30 interest. Total = $230.

Solution. Interest = principal × rate × time = 200 × 0.05 × 3.
200 × 0.05 = 10 per year; × 3 years = **$30** interest.
Total = 200 + 30 = **$230**.

✏️ **Workspace — solve it your way first, then compare**

App 3 — The test-score drop

Your test score fell from **90** to **72**. What is the percent decrease?



Change = 90 − 72 = 18. Percent change = 18 ÷ 90 = 0.20 = 20% decrease.

Solution. Change = 90 − 72 = 18.
Percent change = change ÷ original = 18 ÷ 90 = 0.20.
20% decrease. (Divide by 90 — where you started.)

✏️ **Workspace — solve it your way first, then compare**

KEEP FOREVER

Key Points — Cheat Sheet

- **Discount:** discount = p% × price; sale = price − discount. ($80, 25% off → **$60**)
- **Tax / tip:** amount = p% × bill; total = bill + amount. ($45, 8% tax → **$48.60**)
- **Percent change** = (new − old) ÷ old × 100%. ($50 → $65 = **30% increase**)
- **Simple interest:** I = P × r × t. ($200 × 5% × 3 yr = **$30**)
- Tax is charged on the **sale** price — what you actually pay
- **off + paid = 100%** — find one, and you know the other