More Than One Change

Two or more percents in one problem: finish one change before the next, and ask percent of what at every step. Each change is one multiplier, in order. Percents do not add.

1 THE VOCABULARY
Words we use

Subtotal the total before tax or tip.

One step at a time finish one change, then start the next.

Percent of what the whole changes after every step.

- Watch out for these.
- Adding the percents: 20 off then 10 off is 28 off, not 30.
- Taking the second percent from the original instead of the new amount.
- Rounding in the middle; keep the cents and round at the end.
- Treating a dollar fee like a percent. Dollars are added; percents are multiplied.

2 THE METHOD
More than one change

1. LINE THEM UP write the changes in the order they happen.
2. ONE AT A TIME apply each multiplier to the result of the step before it.
3. PERCENT OF WHAT say it at every step; the whole has changed.
4. ROUND LAST money to the cent at the end.

WHY PERCENTS DO NOT ADD

Each percent is a percent of a specific whole, and the whole is different after every step. Up 10 percent on $100 adds $10, but down 10 percent on $110 takes $11.



Elle, math-speak: A proportional relationship always multiplies by the same number, the unit rate.



Finn, plain English: Percent means out of 100. A percent is a unit rate for 100 instead of for 1: 30 percent means 30 for every 100.

3 THE DINNER, THE CAR, THE SURPRISE
Three stacked problems

$33.28 × 0.075 ≈ $2.50; $35.78; tip on the food $4.99, total $40.77	Abraham's dinner, tip on the food
tip on the bill: $35.78 × 0.15 = $5.37, total $41.15	the order changes what the tip is a percent of
$10,259 × 1.25 × 1.10 = $14,106.13	the used car: fee added, then two multipliers
$100 × 1.10 × 0.90 = $99	up 10, down 10
$50 × 0.80 × 0.90 = $36, which is 28% off	two discounts do not add

THE EXIT TICKET

$50 at 20 percent off is $40; with 6 percent tax, 40 times 1.06 is $42.40.

SAY IT OUT LOUD

One step at a time. Percent of what?