

Percents: Discounts, Sales Tax and Tips

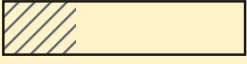
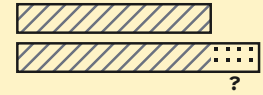
Secret code practice · ages 12–13 (grade 7) · 45 min

Name: _____ Class: _____ Date: _____

7 cm given ? unknown formula

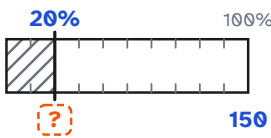
Solve each problem in the grid. Find your answer in the answer bank (page 2) and write its letter in the box. If all your answers are right, the letters spell a message.

Sales tax rates vary by state and city; this sheet uses 8%.

Percent of a number	X% off	X% more (tax, tip)	Percent change
 $\text{number} \times \frac{X}{100}$	 $\text{price} \times \left(1 - \frac{X}{100}\right)$	 $\text{price} \times \left(1 + \frac{X}{100}\right)$	 $\frac{\text{new} - \text{original}}{\text{original}} \times 100$

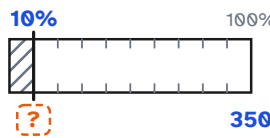
●○○ Level 1 • Percent of a number

1 What is 20% of 150?



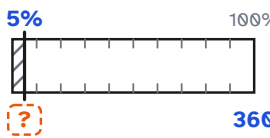
Answer: _____ Letter

2 What is 10% of 350?



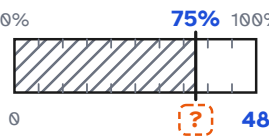
Answer: _____ Letter

3 What is 5% of 360?



Answer: _____ Letter

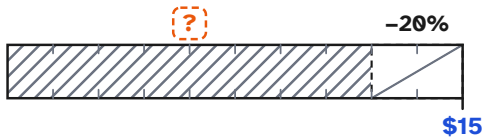
4 What is 75% of 48?



Answer: _____ Letter

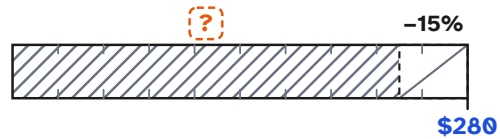
●●○ Level 2 • Discounts, tax and tips

5 A book costs \$15 and is 20% off. How much do you pay (before tax)?



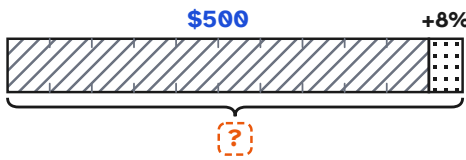
Answer: _____ Letter

6 A bike costs \$280 and is on sale for 15% off. What is the sale price?



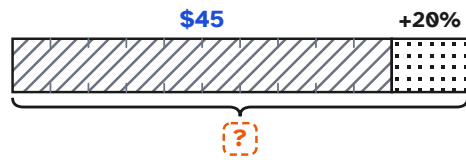
Answer: _____ Letter

7 A TV costs \$500 before tax. What is the total with 8% sales tax?



Answer: _____ Letter

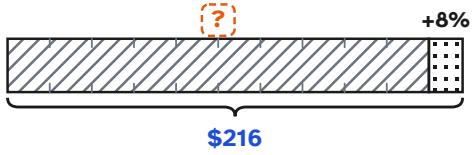
8 A restaurant bill is \$45. You leave a 20% tip. How much do you pay in all?



Answer: _____ Letter

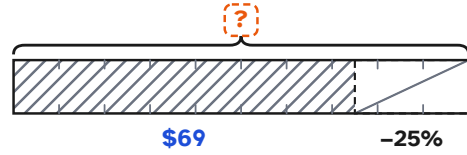
●●● Level 3 · Working backward and percent change

- 9 A receipt shows a total of \$216, including 8% sales tax. What was the price before tax?



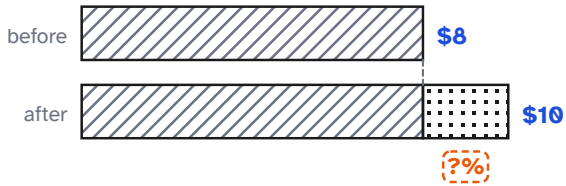
Answer: _____ Letter

- 10** With 25% off, you paid \$69. What was the original price?



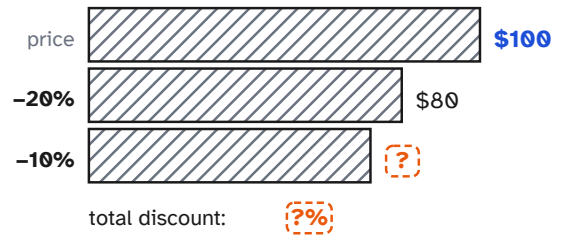
Answer: _____ Letter

- 11** A monthly subscription went up from \$8 to \$10. By what percent did it go up?



Answer: _____ Letter

- 12** A store takes 20% off, and then another 10% off the sale price. What is the total percent off? (Try it with \$100.)



Answer: _____ Letter

Answer bank

3	K	3.5	N	7.5	S	9	R	12	O	18	A	20%	U
25%	A	28%	Y	30	D	30%	P	35	E	36	L	40	B
42	M	54	H	64	I	72%	C	86.25	G	92	D	125%	V
180	W	198.72	N	200	E	238	F	265	S	508	R	540	T

Secret code Write the letter of each problem in its box.

1 2 3 4 5 6 7 8 9 10 11 12

If a letter doesn't fit, check that problem: the bank includes the answers from the most common mistakes.



Check your answers with the step-by-step solution: zapcalculator.com/percentage-calculator
Free to use in the classroom · CC BY 4.0

For the teacher (do not photocopy)

Goal: find a percent of a number, calculate discounts, sales tax and tips with the multiplier $\times (1 \pm X/100)$, work backward to the price before tax and find the percent change.

When: practice or homework, after working with percent bars (tape diagrams). **Time:** 45 min. **Materials:** calculator (optional starting at Level 2). **Standards:** CCSS 6.RP.A.3c, 7.RP.A.3.

Secret message: DEAL OF THE DAY.

Answer key

1. $150 \times 0.20 = 30$
2. $350 \times 0.10 = 35$
3. $360 \times 0.05 = 18$
4. $48 \times 0.75 = 36$
5. $15 \times 0.8 = \$12$
6. $280 \times 0.85 = \$238$
7. $500 \times 1.08 = \$540$
8. $45 \times 1.2 = \$54$
9. $216 \div 1.08 = \$200$
10. $69 \div 0.75 = \$92$
11. $(10 - 8) \div 8 \times 100 = 25\%$
12. $0.8 \times 0.9 = 0.72 \rightarrow$ you pay 72%; 28% off

The mistake behind each answer in the bank

Answer	#	Mistake	Answer	#	Mistake
7.5	1	$150 \div 20$	508	7	added 8
3.5	2	moved the decimal point two places	$40 / 9$	7 / 8	found only the tax / only the tip
180	3	used $5\% = 0.5$	198.72	9	took 8% off the total
64	4	divided by 0.75	86.25	10	multiplied by 1.25
$3 / 42$	5 / 6	found only the discount	$20\% / 125\%$	11	divided by the new price / didn't subtract 100%
265	6	subtracted 15	$30\% / 72\%$	12	added the discounts / mixed up paid and taken off

Mistakes to watch for

- Adding successive discounts ($20\% + 10\%$ is not 30%).
- Removing the tax by taking 8% off a total that already includes it.
- Dividing by the new value when finding the percent change.

Exit ticket

A price goes up 20% and then down 20%. Is it back to the original price? Draw the bars to explain. (No: $100 \rightarrow 120 \rightarrow 96$.)