



a place of mind

FACULTY OF EDUCATION

Department of  
Curriculum and Pedagogy

# Mathematics

## Number: Percents

Science and Mathematics  
Education Research Group

# Shopping with Percents

**10%  
OFF**

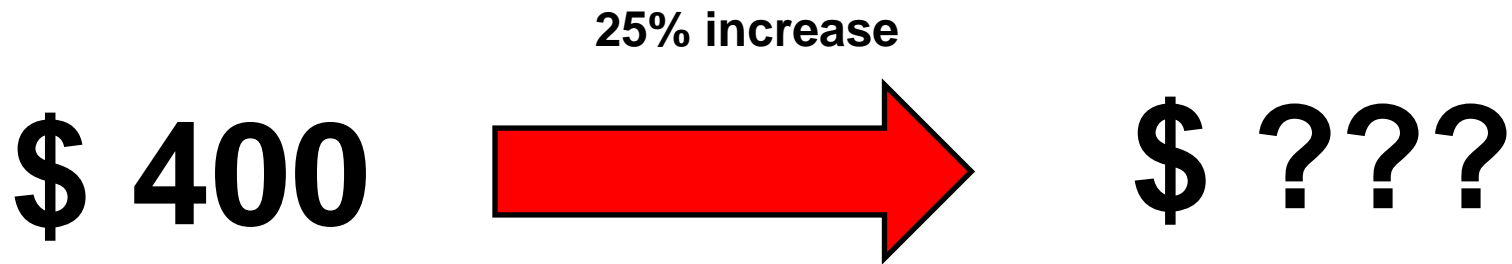


**\$100**

**10%  
TAX**



# Shopping with Percents I



A local computer store receives its stock for \$400 per computer. The store marks up this price by 25%. What is the listed price of the computer before tax?

- A. \$ 100
- B. \$ 425
- C. \$ 450
- D. \$ 475
- E. \$ 500

# Solution

**Answer:** E

**Justification:** A 25% increase means an additional 0.25 times the original price must be paid.

$$\$400 + (\$400 \times 0.25) = \$400 + \$100 = \$500$$

A 25% percent increase also means the same as paying 125% of the original price.

$$\$400 \times 1.25 = \$500$$

Note that a 25% increase does not mean you only pay 25% the original price.

# Shopping with Percents II

Two computer stores each have a promotion on their computers.

**Best Purchase:** 10% off all computers today!

**Future Store:** You pay 90% of the price, we'll pay the rest!

If the computer you want to purchase has the same listed price in both stores, where should you buy your computer?

- A. Best Purchase
- B. Future Store
- C. The price will be the same in both stores

# Solution

**Answer:** C

**Justification:** A 10% off sale is the same as only paying for 90%. Consider a computer that costs \$100.

Best Purchase:

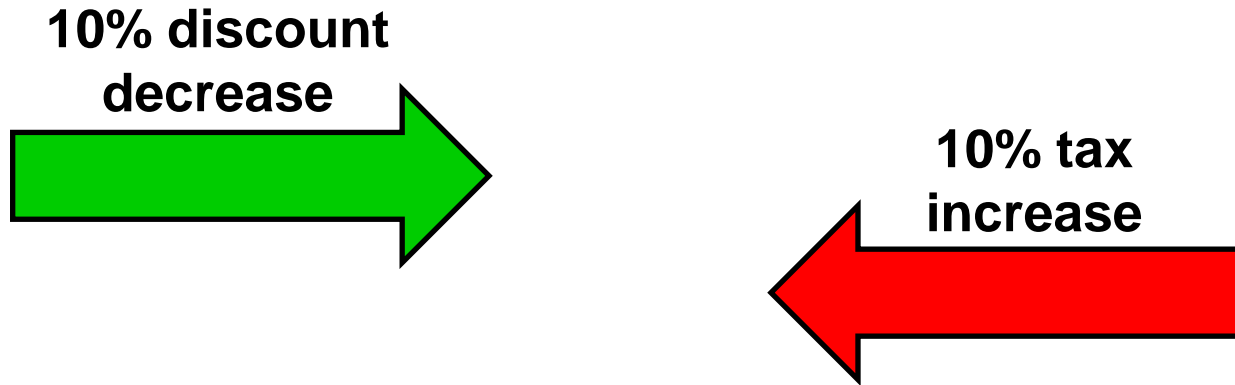
$$10\% \text{ of } \$100 = \$10$$

$$(10\% \text{ off } \$100) = \$100 - (10\% \text{ of } \$100) = \$90$$

Future Store:

$$90\% \text{ of } \$100 = \$100 \times 0.90 = \$90$$

# Shopping with Percents III



Kevin wants to buy the computer listed for \$500. The computer happens to be on sale for 10% off. After the discount, the price is increased by 10% due to tax. The final amount that Kevin has to pay will be:

- A. Greater than \$500
- B. Equal to \$500
- C. Less than \$500

# Solution

**Answer:** C

**Justification:** A 10% discount on \$500 means Kevin only pays for 90% of \$500.

$$0.90 \times \$500 = \$450 \text{ (decrease of \$50)}$$

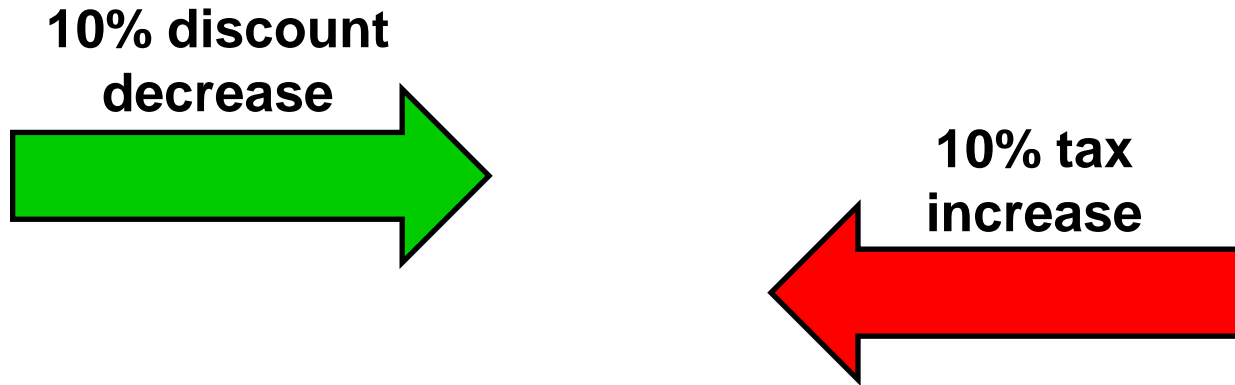
A 10% tax increase means Kevin pays for 110% of the discounted price.

$$1.10 \times \$450 = \$495 \text{ (increase of \$45)}$$

The 10% discount was applied to \$500 while the 10% increase was applied to \$450.



# Shopping with Percents IV



In the previous question, Kevin paid \$495 on an item that was first discounted by 10%, followed by a tax increase of 10%.

If the \$500 item was first increased 10% by tax, followed by a 10% discount, the final price Kevin has to pay will be:

- A. Greater than \$495
- B. Equal to \$495
- C. Less than \$495

# Solution

**Answer:** B

**Justification:** The amount Kevin has to pay will be exactly the same. Note:

$$0.90 \times \$500 = \$450 \text{ (decrease of \$50)}$$

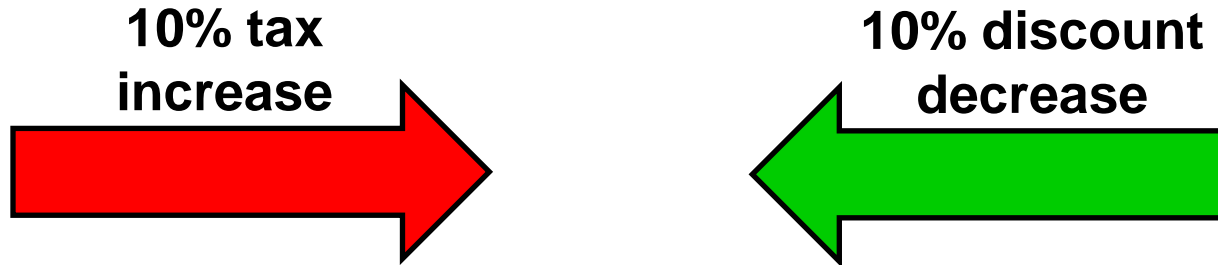
$$1.10 \times \$450 = \$495 \text{ (increase of \$45)}$$

is the same as

$$1.10 \times \$500 = \$550 \text{ (increase of \$50)}$$

$$0.90 \times \$550 = \$495 \text{ (decrease of \$55)}$$

# Shopping with Percents V



If an item's price is increased by 10% then decreased by 10% (or decreased first and then increased), what percent of the original do you have to pay for?

- A. 90%
- B. 99%
- C. 100%
- D. 101%
- E. 110%

# Solution

**Answer:** B

**Justification:** Assume an item costs \$100. For a 10% increase you multiply the cost by 1.1. For a 10% decrease you multiply the cost by 0.9.

$$\$100 \times 1.1 \times 0.9 = \$100 \times 0.9 \times 1.1 = \$99$$

Therefore you actually pay for 99% of the original price.