

# Applications of Percent

Practice

**Estimating with Percent**

**Percent Equations**

**Discounts**

**Simple Interest**

**Commission**

**Percent Change**

**Sales Tax**

## Estimating with Percent

Problem #1: Estimate 35% of 289.

**Hint for Problem #1:** Find 1% of 289. Round to the nearest whole number, and then multiply by 35.

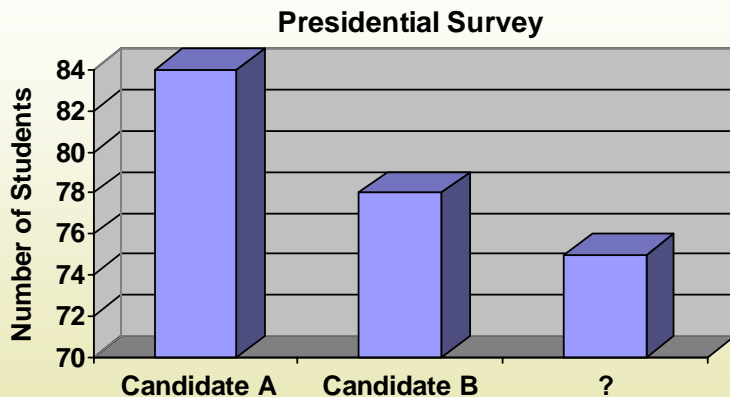
$$\left( \begin{array}{l} 289 \times 0.01 \approx ? \\ ? \times 35 = \underline{\hspace{2cm}} \end{array} \right)$$

Problem #2: Estimate 64% of 893.

**Hint for Problem #2:** Round percent to the nearest percent equal to a simple fraction. Round 893 to 900. Then multiply the simple fraction by 900.

$$\left( \begin{array}{l} 64\% \approx 66\frac{2}{3}\% = \frac{2}{3} \\ ? \times 900 = \underline{\hspace{2cm}} \end{array} \right)$$

Problem #3: The graph below shows the results of a recent survey in which high school students were asked who they favored in the upcoming presidential election. About what percent of the students were undecided? State the letter of the correct estimate.



**Hint for Problem #3:** Refer to the graph to find the number of students undecided (?). Then refer to the graph to find the total number of students. (A + B + ?)

$$\frac{\text{Number of Undecided Students}}{\text{Total Number of Students}} \times 100 \approx \underline{\hspace{2cm}} .$$

- a. 37%   b. 25%   c. 50%   d. 32%



## Percent Equations

A general equation that is used for percent equations is  $P = R \cdot B$ .

$P$  represents **P**ercentage      $R$  represents **R**ate      $B$  represents **B**ase.

**Problem #4: Find 48% of 260 .**

**Hint for Problem #4:**

Given:

0.48 is the **R**ate ( $R$ )

$$(48\% = \frac{48}{100} = 0.48)$$

260 is the **B**ase ( $B$ )  
(follows "of")

Finding: **P**ercent ( $P$ )  
(Part)

$$P = R \cdot B$$

$$P = 0.48 \cdot 260$$

$$P = ?$$

**Problem #5: 125 is 20% of what number?**

**Hint for Problem #5:**

Given:

125 is **P**ercent ( $P$ )  
(Part)

0.2 is the **R**ate ( $R$ )

$$(20\% = \frac{20}{100} = 0.20 = 0.2)$$

Finding: **B**ase ( $B$ )  
(follows "of")

$$P = R \cdot B$$

$$125 = 0.2 \cdot B$$

$$\frac{125}{0.2} = B$$

$$B = ?$$

**Problem #6: 75 is what percent of 250?**

**Hint for Problem #6:**

Given:

75 is **P**ercent ( $P$ )  
(Part)

250 is the **B**ase ( $B$ )  
(follows "of")

Finding:

**R**ate ( $R$ )

$$P = R \cdot B$$

$$75 = R \cdot 250$$

$$\frac{75}{250} = R$$

$$R = ?$$

$$R \cdot 100 = ? \quad (\text{Multiply by } 100)$$

## Discounts

Problem #7: A computer on sale is marked 25% off. What is the amount of discount and sale price of the computer?

**Hint:**

*Step 1:* Change 25% to a decimal.

$$\frac{25}{100} = 0.25$$

*Step 2:* Find the discount:

$$\text{decimal} \times \text{regular price } (P = R \cdot B)$$

$$\text{discount} = 0.25 \times 1049$$

*Step 3:* Find the sale price:

$$\text{sale price} = \text{original price} - \text{discount}$$

$$\text{sale price} = 1049 - \text{discount}$$



## Discounts

Problem #8: Brooke went shopping with her friend Emily to find a dress for the homecoming dance. She chose a dress that was marked **25% off**. The original price of the dress was approximately \$60. Brooke told Emily that the sale price of the dress would be approximately \$45. Was she correct?

a. yes

b. no

### *Hint:*

*Step 1:* Change 25% to a simplified fraction.

$$\frac{25}{100} = \frac{1}{4}$$

*Step 2:* Find the discount:

fraction  $\times$  regular price ( $P = R \cdot B$ )

$$\frac{1}{4} \times 60 = \text{discount}$$

*Step 3:* Find the sale price:

original price  $-$  discount

$$60 - \text{discount} = \text{sale price}$$



## Simple Interest

The simple interest formula is  $I = p r t$ , where  $I$  represents *interest*,  $p$  represents *principal*,  $r$  represents *rate*, and  $t$  represents *time*.

Problem #9: Find the simple interest. Round the answer to the nearest cent.

\$537 at 6.25% for 1 1/2 years

### *Hint:*

*Rate:*            6.25% = 0.0625 (Express as a decimal.)

*Time:*             $1\frac{1}{2} = 1.5$  years

$$I = p \cdot r \cdot t$$

$$I = 537 \cdot 0.0625 \cdot 1.5$$

$$I = \underline{\hspace{2cm}}$$

*Round to the nearest cent.*



## Commission

Problem #10: Jean, a sales associate, is paid on a commission based on total sales per day. She receives a 3% commission of her total sales for selling five items or less. She receives a 4.5% commission if she sells more than five items. On Tuesday, Jean sold three items that totaled \$2,345. What was her commission?

### *Hint:*

$$\text{Commission} = \text{Sales} \times \text{Commission Rate}$$

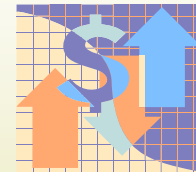
*Step 1:* Change the percent to a decimal.

If five items or less:  $3\% = 0.03$  (*Commission Rate*)

If more than five items:  $4.5\% = 0.045$  (*Commission Rate*)

*Step 2:* Multiply the *Sales* by *Commission Rate*. ( $P = R \cdot B$ )

$$\text{Commission} = 2,345 \times \text{Commission Rate}$$



# Percent Change

**Percent of change** is the ratio of the **amount of change** to **the original amount**.  $Percent\ Change = \frac{Amount\ of\ Change}{Original\ Amount}$

## Percent of Increase

**Problem #11:** A college graduate earned \$34,000 for his first job. Currently, he has a salary of 53,600. His current salary reflects what percent of increase over his first job? Round the answer to the nearest percent.

### Hint:

*Step 1:* Subtract to find the amount of change.  
 $53,600 - 34,000 = Amount\ of\ Change$

*Step 2:* Use the percent equation,  $P = R \cdot B$ , to find the percent of increase.



(*P*) Percentage: *Amount of Change*  
(*B*) Base: *Original Amount = 34,000*

$$P = R \cdot 34,000$$

*Multiply by 100 to express your answer in percent.*

## Percent of Decrease

**Problem #12:** The 9<sup>th</sup> grade math teacher decided to reduce the number of bonus points on the semester exam so the students would have ample time to finish the exam. The original exam had 25 bonus points. The new exam now has 15. Find the percent of decrease in bonus points.

### Hint:

*Step 1:* Subtract to find the amount of change.  
 $25 - 15 = Amount\ of\ Change$

*Step 2:* Use the percent equation,  $P = R \cdot B$ , to find the percent of decrease.



(*P*) Percentage: *Amount of Change*  
(*B*) Base: *Original Amount = 25*

$$P = R \cdot 25$$

*Multiply by 100 to express your answer in percent.*



## Sales Tax

John is purchasing a mini stereo system that is on sale for  $33\frac{1}{3}\%$  off the regular price of \$229.95.

Problem #13: What is John's discount and sale price?

### Hint:

Step 1: Change  $33\frac{1}{3}\%$  into a fraction.

$$\frac{33\frac{1}{3}}{100} = 33\frac{1}{3} \div 100 = \frac{\cancel{100}}{3} \cdot \frac{1}{\cancel{100}} = \frac{1}{3}$$

Step 2: To find the discount:

$$\text{discount} = \frac{1}{3} \times 229.95 \quad (P = R \cdot B)$$

Step 3: Find the sale price:

$$229.95 - \text{discount} = \text{sale price}$$

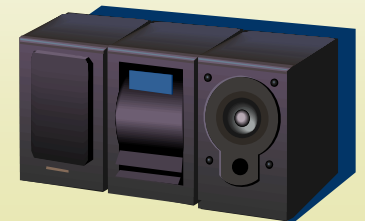
Problem #14: After the price reduction, a 7.5% sales tax is added. Determine the sales tax and final cost for John's mini stereo system. Round the answer to the nearest cent.

### Hint:

$$\begin{aligned} \text{*purchase price} \times \text{rate} &= \text{sales tax} \\ (7.5\% = ? \text{ decimal}) \end{aligned}$$

$$\text{purchase price} + \text{sales tax} = \text{final cost}$$

*\*The purchase price is the sale price determined in Problem #12.*



## Answers

Problem #1: 105

Problem #2: 600

Problem #3: Choice "d".

Problem #4: 124.8

Problem #5: 625

Problem #6: 30%

Problem #7: discount: \$262.25; sale price: \$786.75

Problem #8: Choice "a".

Problem #9: \$50.34

Problem #10: \$70.35

Problem #11: 58%

Problem #12: 40%

Problem #13: discount: \$76.65; sale price: \$153.30

Problem #14: sales tax: \$11.50; sale price: \$164.80

