Taxes & Tips

What does the word "per cent" mean?

Think of "per" as division, like miles per hour.

"cent" = 100. You know there are 100 years in a CENTury or 100 CENTs in a dollar.

So $6\% = \dfrac{6}{100} = 0.06 = 6$ one hundredths.

Problem 1 – Percent %

Write the decimal equivalent of the following percentages by dividing each value by 100. For Questions 4 and 5, write a scenario with the percent.

1. You receive better than average service at a local restaurant and decide to tip 17%._____

2. North Carolina raised their sales tax to 4.5% in 2008. _____

3. For good service the tip for eating at a local restaurant should be 15% before tax.

4. 5.75%._____

5. 10%. _____

- Observe the pattern in the above percentage to decimal conversion. Explain the pattern. What happens to the 'decimal'?

Problem 2 – T = r · p

The amount paid for taxes or tips is a percentage of the price.

The above sentence can be translated into a mathematical formula for ease of use.

"is" means equals and "of" means multiply

When using a formula, it is helpful to know what a variable represents.

Let **T** = amount of tax or tip paid, **r** = tax or tip rate given as a percent, **p** = price.

Item number	Price
1. socks	$4.79
2. hat	$20.53
3. pants	$45.88
4. TI-Nspire	$131.97
5. shoes	$149.99
6. dress	$200.27
7. mp3 player	$250
8. laptop	$1000

$$T = r \cdot p$$

Pick three items listed above and write their names and prices below. Then, choose a tax percentage and write it on each line of the "tax rate" column. Then, use the calculator to compute the taxes paid for each item by multiplying the price by the tax rate.

1. Item _____ price = _____ tax rate = _____ tax paid = _____

2. Item _____ price = _____ tax rate = _____ tax paid = _____

3. Item _____ price = _____ tax rate = _____ tax paid = _____

- What is the sum of the taxes paid on the three items?

- What is the tax paid after summing the prices of the three items?

- How do these two amounts compare?

Problem 3 – Mental Math and Estimation

Often you will only need a quick approximate answer for sales tax or the tip to leave at a restaurant.

Example:

The bill came to $28.85, and you want to leave a 15% tip. One way to find 15% is to find 10% and 5% of the bill and add the two percentages together. Making the true values easier to work with helps a lot.

Step 1: Round $28.85 ≈ $30

Step 2: Find 10% and 5% of the rounded amount. $\dfrac{30}{10} = 3 \rightarrow \dfrac{3}{2} = 1.50$

Step 3: Add the two percentage amounts. $3 + $1.50 = $4.50.

- What actually is 15% of $28.85? Was the estimate above a good one? Explain.

- Estimate the 15% tip if the bill before taxes was $17.97.

- Approximately, what is a 20% tip on $51.12? What was your thought process?

- Describe two ways to use mental math to determine the tax on a $1,000 laptop if the sales tax is 4%.

Extension

You are eating at a restaurant in a state that has 7.25% sales tax. The bill for dinner is $1.98 tax. You decide to leave a 15% gratuity.

- You leave a tip of how much? (Hint: 7.25% times 2 is close to 15%)

- How much was the original bill before tax and tip? Show your calculations.