Sales Tax, Tips, and Markup

Chapter 2 Lesson 6
Find each percent of change. Round to the nearest whole percent if necessary. State whether the percent of change is an \textit{increase} or \textit{decrease}.

1. 50 feet to 80 feet
2. 138 prints to 200 prints
3. $21.50 to $16.25
4. 17 donors to 143 donors
5. Natalie’s kitten weighed 2.7 pounds when she bought it. Now it weighs 4.2 pounds.

6. \textbf{TEST PRACTICE} The first movie released by a film company this year made $20.4 million at the box office and the second movie made $13.2 million. What was the percent of change in the film company’s revenues?

A. 35\% \text{ increase} \quad \text{C. 7.2\% increase}
B. 35\% \text{ decrease} \quad \text{D. 7.2\% decrease}
$1.60\%$, increase

$2.45\%$, increase

$3.24\%$, increase

$4.741\%$, decrease

$5.56\%$, increase
Vocabulary:

**Sales Tax:** An additional amount of money charged on items that people buy.

**Tip/Gratuity:** Small amount of money in return for a service.

**Mark-Up:** The amount the price of an item is increased above the price the store paid for them.

**Selling Price:** The amount the customer pays for an item.
Ex.1) Drew wants to buy exercise equipment that costs $140 and the sales tax is 5.75%. What is the total cost of the equipment?

**Method 1** Add sales tax to the regular price.

1. First, find the sales tax. Let $t$ represent the sales tax.
2. Write the percent equation.
   \[
   \text{part} = \frac{\text{percent}}{100} \times \text{whole}
   \]
3. \[
   t = 0.0575 \times 140 \quad \text{5.75\% = 0.0575}
   \]
   \[
   t = 8.05 \quad \text{Multiply.}
   \]
4. Next, add the sales tax to the regular price. $8.05 + $140 = $148.05

**Method 2** Add the percent of the tax to 100%.

1. \[
   100\% + 5.75\% = 105.75\% \quad \text{Add the percent of tax to 100\%.}
   \]
2. Let $t$ represent the total.
3. Write the percent equation.
   \[
   \text{part} = \frac{\text{percent}}{100} \times \text{whole}
   \]
4. \[
   t = 1.0575 \times 140 \quad \text{105.75\% = 1.0575}
   \]
5. \[
   t = 148.05 \quad \text{Multiply.}
   \]
6. The total cost of the exercise equipment is $148.05.
Ex. 2) A customer wants to tip 15% on a restaurant bill that is $35. What will be the total bill with tip?

**Method 1** Add the tip to the regular price.

1. First, find the tip. Let \( t \) represent the tip.
   
   \[
   \text{part} = \frac{\text{percent}}{100} \times \text{whole} \quad \text{Write the percent equation.}
   \]
   
   \[
   t = 0.15 \times 35 \quad 15\% = 0.15
   \]
   
   \[
   t = 5.25 \quad \text{Multiply.}
   \]

2. Next, add the tip to the bill.
   
   \[
   \$5.25 + \$35 = \$40.25 \quad \text{Add.}
   \]

**Method 2** Add the percent of tip to 100%.

3. 100% + 15% = 115% \quad \text{Add the percent of tip to 100%}

4. The total cost is 115% of the bill. Let \( t \) represent the total.

   \[
   \text{part} = \frac{\text{percent}}{100} \times \text{whole} \quad \text{Write the percent equation.}
   \]

   \[
   t = 1.15 \times 35 \quad 115\% = 1.15
   \]

   \[
   t = 40.25 \quad \text{Multiply.}
   \]

Using either method, the total cost of the bill with tip is $40.25.
Practice Problems:

1. A limited-edition soccer ball costs $30, and the sales tax is 6%. What is the total cost?

2. Whitney’s bill at dinner came to $26. What would she pay if she included a 20% tip?
Answers:
1. $31.80
2. $31.20
3. A haircut costs $20. Sales tax is 4.75%. Is $25 sufficient to cover the haircut with tax and a 15% tip?

Sales tax is 4.75% and the tip is 15%, so together they will be 19.75%.

2. Let $t$ represent the tax and tip.

3. \[
\text{part} = \text{percent} \times \text{whole} \\
\begin{align*}
\phantom{t} & = 0.1975 \times 20 \\
& = 0.15 + 0.0475 = 0.1975
\end{align*}
\]

4. \[t = 3.95 \quad \text{Multiply.}\]

5. \[$20 + 3.95 = $23.95 \quad \text{Add.}\]

6. Since $23.95 < $25, $25 is sufficient to cover the total cost.
4. A store pays $56 for a GPS navigation system. The markup is 25%. Find the selling price.

1. First, find the markup. Let \( m \) represent the markup.

2. Write the percent equation.
   
   \[
   \frac{\text{part}}{\text{whole}} = \frac{\text{percent}}{100} \times \text{whole}
   \]
   
   \[
   m = 0.25 \times 56
   \]
   
   \[
   25\% = 0.25
   \]

3. Multiply.
   
   \[
   m = 14
   \]

4. Next, add the markup to the amount the store pays.

5. Add.
   
   \[
   $14 + $56 = $70
   \]

6. The selling price of the GPS navigation system is $70.
Practice Problems:

1. A manicure cost $18. The sales tax cost 8.25%. You want to tip 20%. Is $22 sufficient to cover the manicure, tax, and tip?

2. The wholesale cost for shirts bought by a sporting goods store is $20 per shirt. The shirts will be marked up 40%. What will be the selling price?
Answers:

1. No:

28.25% of 18 is $5.09 and $18+
$5.09=$23.09

2. $28
A music CD costs $18.

What is the total cost of the CD if there is a 6.25% sales tax?