Lesson 7: Markup and Markdown Problems

Classwork

**Example 1: A Video Game Markup**

Games Galore Super Store buys the latest video game at a wholesale price of $\$30.00$. The markup rate at Game’s Galore Super Store is $40\%$. You use your allowance to purchase the game at the store. How much will you pay, not including tax?

1. Write an equation to find the price of the game at Games Galore Super Store. Explain your equation.
2. Solve the equation from part (a).
3. What was the total markup of the video game? Explain.
4. You and a friend are discussing markup rate. He says that an easier way to find the total markup is by multiplying the wholesale price of $\$30.00$ by $40\%$. Do you agree with him? Why or why not?

**Example 2: Black Friday**

A $\$300$ mountain bike is discounted by $30\%$, and then discounted an additional $10\%$ for shoppers who arrive before 5:00 a.m.

1. Find the sales price of the bicycle.
2. In all, by how much has the bicycle been discounted in dollars? Explain.
3. After both discounts were taken, what was the total percent discount?
4. Instead of purchasing the bike for $\$300$, how much would you save if you bought it before 5:00 a.m.?

Exercises 1–3

$$\$44.00$$

1. Sasha went shopping and decided to purchase a set of bracelets for $25\%$ off of the regular price. If Sasha buys the bracelets today, she will receive an additional $5\%$. Find the sales price of the set of bracelets with both discounts. How much money will Sasha save if she buys the bracelets today?
2. A golf store purchases a set of clubs at a wholesale price of $\$250$. Mr. Edmond learned that the clubs were marked up $200\%$. Is it possible to have a percent increase greater than $100\%$? What is the retail price of the clubs?
3. Is a percent increase of a set of golf clubs from $\$250$ to $\$750 $the same as a markup rate of $200\%$? Explain.

Example 3: Working Backward

A car that normally sells for $\$20,000$ is on sale for $\$16,000$. The sales tax is $7.5\%$.

* 1. What percent of the original price of the car is the final price?
	2. Find the discount rate.
	3. By law, sales tax has to be applied to the discount price. However, would it be better for the consumer if the $7.5\%$ sales tax was calculated before the $20\%$ discount was applied? Why or why not?
	4. Write an equation applying the commutative property to support your answer to part (c).

Exercise 4

* 1. Write an equation to determine the selling price in dollars, $p$, on an item that is originally priced $s$ dollars after a markup of $25\%$.
	2. Create and label a table showing five possible pairs of solutions to the equation.
	3. Create and label a graph of the equation.

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* 1. Interpret the points $(0,0)$ and $(1, r)$.

Exercise 5

Use the following table to calculate the markup or markdown rate. Show your work. Is the relationship between the original price and selling price proportional or not? Explain.

|  |  |
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| Original Price, $m$(in dollars) | Selling Price, $p$(in dollars) |
| $$\$1,750$$ | $$\$1,400$$ |
| $$\$1,500$$ | $$\$1,200$$ |
| $$\$1,250$$ | $$\$1,000$$ |
| $$\$1,000$$ | $$\$800$$ |
| $$\$750$$ | $$\$600$$ |

Lesson Summary

* To find the markup or markdown of an item, multiply the whole by $(1\pm m)$, where $m$ is the markup/markdown rate.
* To apply multiple discount rates to the price of an item, you must find the first discount price and then use this answer to get the second discount price.

Problem Set

1. You have a coupon for an additional $25\%$ off the price of any sale item at a store. The store has put a robotics kit on sale for $15\%$ off the original price of $\$40$. What is the price of the robotics kit after both discounts?
2. A sign says that the price marked on all music equipment is $30\% $off the original price. You buy an electric guitar for the sale price of $\$315$.
	1. What is the original price?
	2. How much money did you save off the original price of the guitar?
	3. What percent of the original price is the sale price?
3. The cost of a New York Yankee baseball cap is $\$24.00$. The local sporting goods store sells it for $\$30.00$. Find the markup rate.
4. Write an equation to determine the selling price in dollars, $p$, on an item that is originally priced $s$ dollars after a markdown of $15\%$.
	1. Create and label a table showing five possible pairs of solutions to the equation.
	2. Create and label a graph of the equation.

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* 1. Interpret the points $(0,0)$ and $\left(1, r\right)$.
1. At the amusement park, Laura paid $\$6.00$ for a small cotton candy. Her older brother works at the park, and he told her they mark up the cotton candy by $300\%$. Laura does not think that is mathematically possible. Is it possible, and if so, what is the price of the cotton candy before the markup?
2. A store advertises that customers can take $25\%$ off the original price and then take an extra $10\%$ off. Is this the same as a $35\% $off discount? Explain.
3. An item that costs $\$50.00$ is marked $20\%$ off. Sales tax for the item is$ 8\%$. What is the final price, including tax?
	1. Solve the problem with the discount applied before the sales tax.
	2. Solve the problem with the discount applied after the sales tax.
	3. Compare your answers in parts (a) and (b). Explain.
4. The sale price for a bicycle is $\$315$. The original price was first discounted by $50\%$ and then discounted an additional $10\%$. Find the original price of the bicycle.
5. A ski shop has a markup rate of $50\%$. Find the selling price of skis that cost the storeowner $\$300$.
6. A tennis supply store pays a wholesaler $\$90$ for a tennis racquet and sells it for $\$144$. What is the markup rate?
7. A shoe store is selling a pair of shoes for $\$60$ that has been discounted by $25\%$. What was the original selling price?
8. A shoe store has a markup rate of $75\%$ and is selling a pair of shoes for $\$133$. Find the price the store paid for the shoes.
9. Write $5\frac{1}{4}\%$ as a simple fraction.
10. Write $\frac{3}{8}$ as a percent.
11. If $20\%$ of the $70$ faculty members at John F. Kennedy Middle School are male, what is the number of male faculty members?
12. If a bag contains $400$ coins, and $33\frac{1}{2}\%$ are nickels, how many nickels are there? What percent of the coins are not nickels?
13. The temperature outside is $60 $degrees Fahrenheit. What would be the temperature if it is increased by $20\%$?