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?

a. Write an equation to find the price of the game at Games Galore Super Store. Explain your equation.

b. Solve the equation from part (a).

c. What was the total markup of the video game? Explain.

d. 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 $\$30$ 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.

a. Find the sales price of the bicycle.

b. In all, by how much has the bicycle been discounted in dollars? Explain.

c. After both discounts were taken, what was the total percent discount?

d. Instead of purchasing the bike for $\$300$, how much would you save if you bought it before 5:00 a.m.?

Exercises 1–3

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 Backwards

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

a. What percent of the original price of the car is the final price?

b. Find the discount rate.

c. By law, sales tax has to be applied to the discount price. Would it be better for the consumer if the 7.5% sales tax were calculated before the 20% discount was applied? Why or why not?

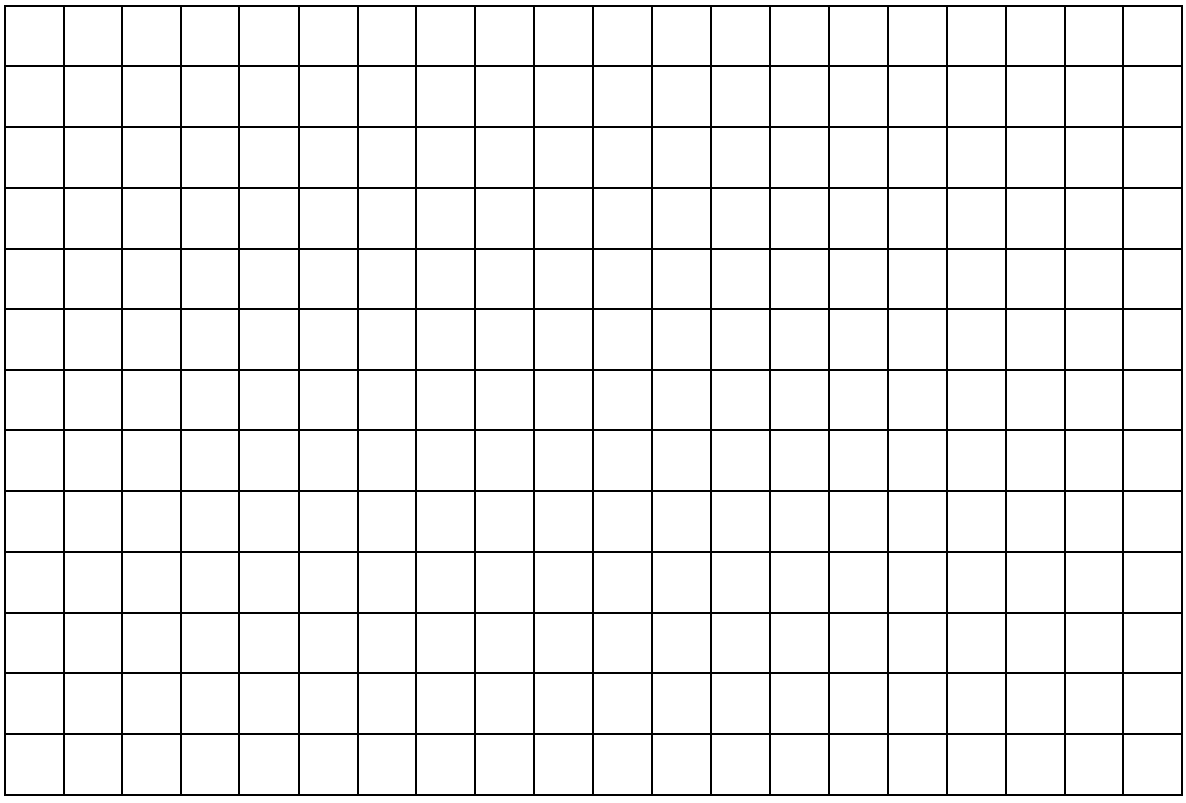
d. Write an equation applying the commutative property to support your answer to part (c).

Exercise 4

a. Write an equation to determine the selling price, p, on an item that is originally priced s dollars after a markup of 25%.

b. Create a table (and label it) showing five possible pairs of solutions to the equation.

c. Create a graph (and label it) of the equation.



d. 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.

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

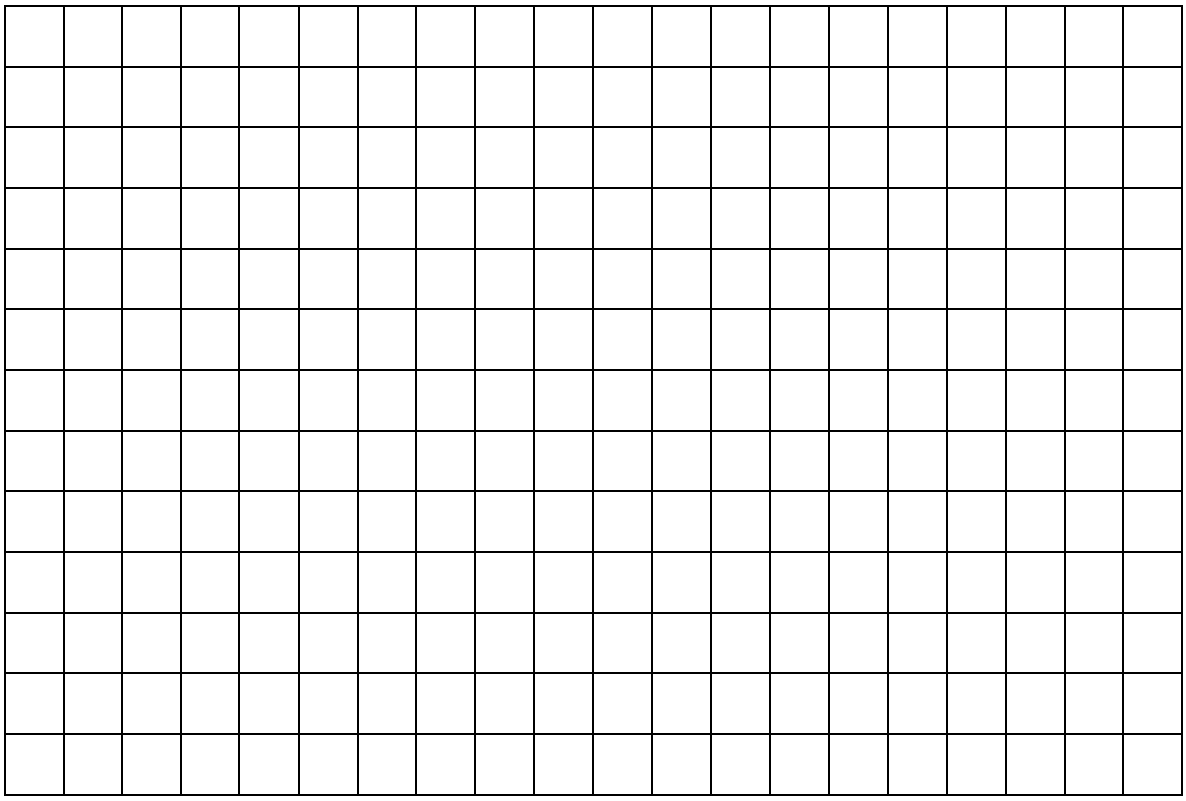
Problem Set

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 $\$315$.
   a. What is the original price?
   b. How much money did you save off the original price of the guitar?
   c. What percent of the original price is the sale price?

3. The cost of a New York Yankees 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, p, on an item that is originally priced s dollars after a markdown of 15%.
   a. Create a table (and label it) showing five possible pairs of solutions to the equation.
   b. Create a graph (and label it) of the equation.



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

5. 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?

6. A store advertises that customers can take 25% off the original price and then take an extra 10% off. Is this 35% off? Explain.

7. An item that costs $\$50$ is marked 20% off. Sales tax for the item is 8%. What is the final price, including tax?
   a. Solve the problem with the discount applied before the sales tax.
   b. Solve the problem with discount applied after the sales tax.
   c. Compare your answers in parts (a) and (b). Explain.

8. The sale price for a bicycle is $\$315$ dollars. The original price was first discounted by 50% and then discounted an additional 10%. Find the original price of the bicycle.

9. A ski shop has a markup rate of 50%. Find the selling price of skis that cost the storeowner $\$300$.

10. A tennis supply store pays a wholesaler $\$90$ for a tennis racquet and sells it for $\$144$. What is the markup rate?

11. A shoe store is selling a pair of shoes for $\$60$ that has been discounted by 25%. What was the original selling price?

12. 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.

13. Write $5\frac{1}{4}\%$ as a simple fraction.

14. Write $\frac{3}{8}$ as a percent.

15. If 20% of the 70 faculty members at John F. Kennedy Middle School are male, what is the number of male faculty members?

16. 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?