

Lesson 14: Multi-Step Ratio Problems

Classwork

Example 1: Bargains

Peter's Pants Palace advertises the following sale: Shirts are $\frac{1}{2}$ off the original price; pants are $\frac{1}{3}$ off the original price, and shoes are $\frac{1}{4}$ off the original price.

- a. If a pair of shoes cost \$40, what is the sales price?

- b. At Peter's Pants Palace, a pair of pants usually sells for \$33.00. What is the sale price of Peter's pants?

Example 2: Big Al's Used Cars

A used car salesperson receives a commission of $\frac{1}{12}$ of the sales price of the car for each car he sells. What would the sales commission be on a car that sold for \$21,999?

Example 3: Tax Time

As part of a marketing plan, some businesses mark up their prices before they advertise a sales event. Some companies use this practice as a way to entice customers into the store without sacrificing their profits.

A furniture store wants to host a sales event to improve its profit margin and to reduce its tax liability before its inventory is taxed at the end of the year.

How much profit will the business make on the sale of a couch that is marked-up by $\frac{1}{3}$ and then sold at a $\frac{1}{5}$ off discount if the original price is \$2,400?

Example 4: Born to Ride

A motorcycle dealer paid a certain price for a motorcycle and marked it up by $\frac{1}{5}$ of the price he paid. Later he sold it for \$14,000. What is the original price?

Lesson Summary

- Discount price = original price – rate \times original price OR $(1 - \text{rate}) \times \text{original price}$
- Commission = rate \times total sales amount
- Markup price = original price + rate \times original price OR $(1 + \text{rate}) \times \text{original price}$

Problem Set

1. A salesperson will earn a commission equal to $\frac{1}{32}$ of the total sales. What is the commission earned on sales totaling \$24,000?
2. DeMarkus says that a store overcharged him on the price of the video game he bought. He thought that the price was marked $\frac{1}{4}$ of the original price, but it was really $\frac{1}{4}$ off the original price. He misread the advertisement. If the original price of the game was \$48, what is the difference between the price that DeMarkus thought he should pay and the price that the store charged him?
3. What is the cost of a \$1,200 washing machine after a discount of $\frac{1}{5}$ the original price?
4. If a store advertised a sale that gave customers a $\frac{1}{4}$ discount, what is the fractional part of the original price that the customer will pay?
5. Mark bought an electronic tablet on sale for $\frac{1}{4}$ off the original price of \$825.00. He also wanted to use a coupon for $\frac{1}{5}$ off the sales price. Before taxes, how much did Mark pay for the tablet?
6. A car dealer paid a certain price for a car and marked it up by $\frac{7}{5}$ of the price he paid. Later he sold it for \$24,000. What is the original price?
7. Joanna ran a mile in physical education class. After resting for one hour, her heart rate was 60 beats per minute. If her heart rate decreased by $\frac{2}{5}$, what was her heart rate immediately after she ran the mile?