Discount and Markup

Essential Question

How can you use proportional relationships to solve real-world percent problems?

CCSS **Common Core State Standards**

Content Standards
7.RP.3, 7.EE.2, 7.EE.3

Mathematical Practices
1, 3, 4

Vocabulary

markup
selling price
discount

What You'll Learn

• Solve real-world problems involving markup.
• Solve real-world problems involving discount.

Real-World Link

School Supplies Some states have sales tax holidays. Depending on where you live, clothes, computers, and school supplies may be tax free for two to seven days during the summer. This "holiday" and the back-to-school sales make it a perfect time to shop!

Using Markup

A store sells items for more than it pays for those items. The amount of increase is called the **markup**. The percent of markup is a percent of increase. The **selling price** is the amount the customer pays for an item.

Example 1

Tutor

Find the selling price if a store pays $42 for a pair of in-line skates and the markup is 25%.

Method 1 **Find the amount of the markup first.**

The whole is $42. The percent is 25. You need to find the amount of the markup, or the part. Let m represent the amount of the markup.

$m = 0.25 \cdot 42$ part = percent • whole

$m = 10.5$ Multiply.

Then add the markup to the cost. So, $42 + $10.50 = $52.50.

Method 2 **Find the total percent first.**

Use the percent equation to find 100% + 25% or 125% of the price. Let p represent the price.

$p = 1.25(42)$ part = percent • whole

$p = 52.50$ Multiply.

Using either method, the selling price is $52.50.

Got It? **Do this problem to find out.**

1. Find the selling price if a store pays $75 for a bike and the markup is 40%. **$105**

Using Discount

A **discount** is the amount by which the regular price is reduced. The percent of discount is a percent of decrease.

Example 2

Summer Sports is having a sale. A volleyball has an original price of $59. It is on sale for 65% off the original price. Find the sale price of the volleyball.

Method 1 **Find the amount of the discount.**

The percent is 65 and the whole is 59. Let d represent the amount of the discount.

$d = 0.65 \cdot 59$ part = percent · whole

$d = 38.35$ Multiply.

Subtract the discount from the original cost to find the sale price.
So, $59 − $38.35 = $20.65.

Method 2 **Find the total percent first.**

If the amount of the discount is 65%, the percent the customer will pay is 100% − 65% or 35%. Find 35% of $59.

Let s represent the sale price.

$s = 0.35(59)$ part = percent · whole

$s = 20.65$ Multiply.

Using either method, the sale price of the volleyball is $20.65.

Watch Out!

Remember to convert the percent to a decimal when finding a discount or a markup.

Got It? Do this problem to find out.

2. A magazine subscription has a cover price of $35. It is on sale for 67% off the original price. Find the sale price of the magazine subscription. **$11.55**

Example 3

Financial Literacy Henrik had a 25% discount on hockey equipment. The selling price was $172.50. What was the original price?

If the amount of the discount is 25%, the selling price was 100% − 25% or 75%. 75% of the original price is $172.50.

Let r represent the original price.

$\dfrac{172.5}{r} = \dfrac{75}{100}$ Write the percent proportion.

$172.5 \cdot 100 = 75r$ Find the cross products.

$17{,}250 = 75r$ Multiply.

$230 = r$ Divide each side by 75.

The original price was $230.

Got It? Do this problem to find out.

3. Luisa got a 75% discount on a sofa. She paid a total of $225. What was the original price? **$900**

Example 4

Cody is buying a ring that had an original price of $295 but is advertised at 30% off. Sales tax of 8.25% is applied to the discounted price. How much will Cody pay for the ring?

Discount and Markup

Remember that for markup, you can use $x + 0.0825x$ or $1.0825x$. For discount, you can use $x - 0.3x$ or $0.7x$.

Step 1 Find the discounted price.

If the amount of the discount is 30%, the discounted price is 100% − 30% or 70%. Find 70% of $295.

Let d represent the discounted price.

$d = 0.7(295)$ part = percent • whole

$d = 206.5$ Multiply.

The discounted price is $206.50.

Step 2 Add the sales tax.

Use the percent equation to find 100% + 8.25%, or 108.25% of the discounted price.

Let s represent the selling price, or the amount Cody paid.

$s = 1.0825(206.5)$ part = percent • whole

$s = 223.53625$ Multiply.

Rounded to the nearest cent, Cody paid $223.54

Got It? **Do this problem to find out.**

4. A CD with an original price of $11.95 is discounted 20%. Sales tax of 5.5% is added to the discounted price. How much does it cost to purchase the CD? **$10.09**

Check

Guided Practice

Find the selling price for each item given the cost and the percent of markup. (Example 1)

1. shoes: $30; 25% markup **$37.50**
2. CD player: $45; 31% markup **$58.95**
3. jeans: $22; 20% markup **$26.40**
4. guitar: $100; 34% markup **$134.00**
5. swim suit: $36: 28% markup **$46.08**
6. flash drive: $12: 35% markup **$16.20**

7. Find the sale price of a bike that is regularly $110 and is on sale for 45% off the original price. (Example 2) **$60.50**

8. An art supply store has a sale advertising 40% off all canvases. Shelly buys four large canvases and pays a total of $141.60. How much would she have paid without the discount? (Example 3) **$236**

9. Danisha picks up a takeout meal at a local restaurant that is discounted 25%. The price is $24.60 without the discount, and sales tax of 4.5% is added. How much does Danisha pay? (Example 4) **$19.28**