

Develop Solving Problems Involving Multiple Percents

► Read and try to solve the problem below.

The guitar Francisca wants is on sale at two different stores. The original price of the guitar at both stores is \$160. At which store is the guitar less expensive? How much less expensive?

TRY IT



Math Toolkit double number lines, grid paper

A

$$160(0.25) = 40$$

B

$$160 \div 2 = 80$$

$$80(0.70) = 56$$

$$56 - 40$$

The guitar is \$16 less at Store A

STORE A

75% OFF
GUITARS

STORE B

50% OFF
GUITARS

+

ADDITIONAL
30% OFF
ALL DISCOUNTED
PRICES

DISCUSS IT

Ask: How is each percent represented in your solution?

Share: In my solution each percent is represented by ...

DISCUSS IT*continued***► Explore different ways to solve a problem involving multiple percents.**

The guitar Francisca wants is on sale at two different stores. The original price of the guitar at both stores is \$160. At Store A, the guitar is 75% off. At Store B, the guitar is 50% off, with an additional 30% off the discounted price. At which store is the guitar less expensive? How much less expensive?

Model It

You can find each percent separately.

Store A

A discount of 75% is the same as paying 25% of the original price.

$$\begin{aligned} 25\% \text{ of } 160 &= (0.25)(160) \\ &= 40 \end{aligned}$$

Store B

The 50%-off price is $100\% - 50\%$, or 50%, of the original price.

$$\begin{aligned} 50\% \text{ of } 160 &= (0.5)(160) \\ &= 80 \end{aligned}$$

An additional 30% discount is applied to the 50%-off price of the guitar.

A discount of 30% is the same as paying 70% of the price.

$$\begin{aligned} 70\% \text{ of } 80 &= (0.7)(80) \\ &= 56 \end{aligned}$$

Model It

You can find multiple percents at one time.

Store A

$$\begin{aligned} 25\% \text{ of } 160 &= (0.25)(160) \\ &= 40 \end{aligned}$$

Store B

$$70\% \text{ of } 50\% \text{ of } 160 = (0.7)(0.5)(160)$$

you are paying 70% of the 50%

$$\begin{aligned} &= (0.7)(80) \\ &= 56 \end{aligned}$$



CONNECT IT

- Use this page to deepen your understanding of solving a problem involving multiple percents.

1 Talk About It

- a. Look at the **Model Its**. Why does the expression $(0.7)(0.5)(160)$ represent the price of a guitar at Store B?

You are paying 70% of the 50% from the first discount

- b. Why is the sale price at Store B 35% of the original price?

$$(0.7)(0.5) = 0.35 = 35\%$$

- c. Why would the amount Francisca would pay at Store B not change if the sale were 30% off the price of the guitar, with an additional 50% off all sale prices?

You are paying 50% of the 70% from the first discount
 $(0.50)(0.70) = 0.35 = 35\%$

2 Show What You Know

Explain why a 75% discount followed by an additional 25% discount is not the same as a 100% discount.

You are paying 75% of the 25% from the first discount

$$(0.75)(0.25) = 0.1875 = 18.75\% \text{ discount}$$

- 3 **Reflect** Think about all the models and strategies you have discussed today. Describe how one of them helped you better understand how to solve the **Try It** problem.

Apply It

► Use what you learned to solve these problems.

- 4 A bookstore has 120 science fiction books. It has 30% fewer mysteries than science fiction books. It has 25% more biographies than mysteries. How many biographies are in the bookstore? Show your work.

$$120(0.70) = 84 \text{ mysteries}$$

$$84(1.25) = 105 \text{ biographies}$$

SOLUTION There are 105 biographies

- 5 Members of a community garden grow 500 vegetable plant sprouts. They donate 10% of the sprouts to a school. They sell 20% of the remaining sprouts to a local park. They plant 5% of those left in a greenhouse. Then they plant the rest of the sprouts outside. How many sprouts do the community garden members plant outside? Show your work.

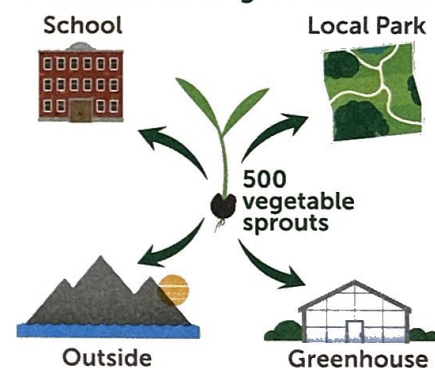
$$500(0.90) = 450 \text{ after donation}$$

$$450(0.80) = 360 \text{ after park}$$

$$360(0.95) = 342 \text{ after greenhouse}$$

↓ outside

Community Garden



SOLUTION They plant 342 sprouts outside

- 6 A store manager buys binoculars for \$45 each. They mark up the cost by 40% to set the store price. Then the store has a sale and the store price is reduced by 10%. What is the sale price of the binoculars? Show your work.

$$45(1.4) = 63$$

$$63(0.9) = 56.70$$

SOLUTION The sale price of the binoculars is \$56.70