

Develop Solving Problems Involving a Single Percent

► Read and try to solve the problem below.

Tahera's family attends a festival in Los Angeles to celebrate Nowruz, the Persian New Year. After the festival, she hosts a family dinner. Her groceries cost \$150 before she uses a 10%-off coupon. She also has \$90 worth of flowers delivered. There is a combined sales tax and delivery fee for the flowers of 12.5%. What is the total amount Tahera spends?



TRY IT



Math Toolkit double number lines, grid paper

Groceries

$$150 \cdot 0.10 = \$15$$

$$150 - 15 = \$135$$

Flowers

$$90 \cdot 0.125 = \$11.25$$

$$90 + 11.25 = \$101.25$$

$$135 + 101.25 = 236.25$$

Tahera will spend a total of \$236.25

DISCUSS IT

Ask: How would you explain what the problem is asking in your own words?

Share: The problem is asking ...

DISCUSS IT

continued

- Explore different ways to solve a problem involving a single percent.

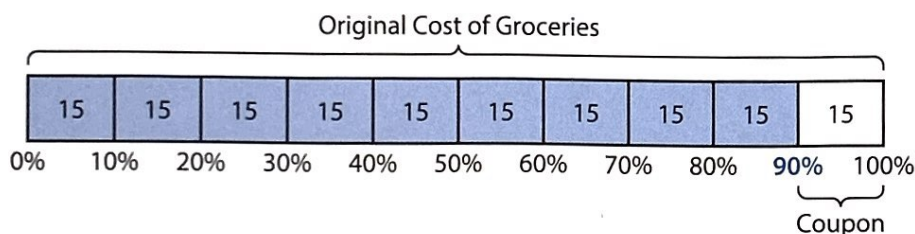
Tahera's family attends a festival in Los Angeles to celebrate Nowruz, the Persian New Year. After the festival, she hosts a family dinner. Her groceries cost \$150 before she uses a 10%-off coupon. She also has \$90 worth of flowers delivered. There is a combined sales tax and delivery fee for the flowers of 12.5%. What is the total amount Tahera spends?



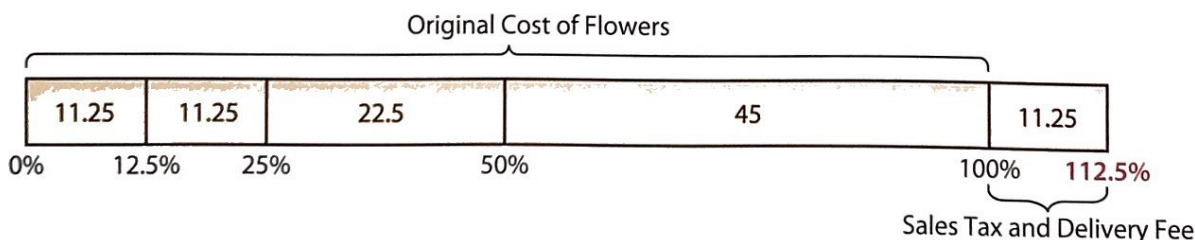
Nowruz celebration

Model It

You can draw bar models to find the percents.



Tahera pays **90%** of the original cost for groceries.



Tahera pays **112.5%** of the original cost for flowers.

Model It

You can write equations to solve the problem.

Cost of Groceries:

$$\begin{aligned}
 (100\% - 10\%)150 &= (90\%)150 \\
 &= (0.90)(150)
 \end{aligned}$$

↗ % paid

Cost of Flowers:

$$\begin{aligned}
 (100\% + 12.5\%)90 &= (112.5\%)90 \\
 &= (1.125)(90)
 \end{aligned}$$

↗ % paid

Total Cost = Cost of Groceries + Cost of Flowers

CONNECT IT

- Use this page to deepen your understanding of solving a problem involving a single percent.

1 Talk About It

- a. Hiroaki uses the expression $a - 0.1a$ to represent a 10% discount on an amount a . Allen uses the expression $0.9a$. Why can both Hiroaki's and Allen's expressions be used?

Hiroaki is showing how much savings there is subtracted from the total.

Allen is showing the percent being paid so no subtraction is needed

- b. Hiroaki uses the expression $a + 0.05a$ to represent an amount increasing by 5%. Allen uses the expression $1.05a$. Why can both Hiroaki's and Allen's expressions be used?

Hiroaki is showing the extra percent added to the total

Allen is showing the percent paid

2 Show What You Know

The expression $(110)(0.80)$ can be used to find the sale price of an item that has an original price of \$110. By what percent is the original price marked down? Explain.

It is marked down 20%

0.80 shows the percent being paid

- 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

Commission: a percent of sales
an employee receives for their
work

► Use what you learned to solve these problems.

- 4 Yasmin earns a commission of 8% on her sales. How much commission does Yasmin earn on a sale of \$32,000? Show your work.

$$32000(0.08)$$

$$2560$$

SOLUTION

Yasmin earns \$2560 in commission

- 5 Heidi takes her grandfather out to lunch at a restaurant. Their lunch costs \$37.50. Heidi pays the bill and leaves a tip of 18%. How much money does Heidi pay for lunch, including the tip?

A \$6.75

$$37.50(1.18)$$

B \$30.75

$$44.25$$

C \$44.25

D \$55.50

- 6 Before hibernation, a bear weighs 990 pounds. Its weight decreases by 32% during hibernation. How much does the bear weigh when it comes out of hibernation? Show your work.

$$990(0.68)$$

$$673.2$$



SOLUTION

The bear will weigh 673.2 pounds