



# Recalling Percent Change

Let's find the result of changing a number by a percentage.

## 14.1 Wheels

A scooter costs \$160.

For each question, show your reasoning.



1. The cost of a pair of roller skates is 20% of the cost of the scooter. How much do the roller skates cost?
2. A bicycle costs 20% more than the scooter. How much does the bicycle cost?
3. A skateboard costs 25% less than the bicycle. How much does the skateboard cost?

## 14.2 Taxes and Sales

1. You need to pay 8% tax on a car that costs \$12,000. What will you end up paying in total? Show your reasoning.
2. Burritos are on sale for 30% off. Your favorite burrito normally costs \$8.50. How much does it cost now? Show your reasoning.
3. A pair of shoes that originally cost \$79 are on sale for 35% off. Does the expression  $0.65(79)$  represent the sale price of the shoes (in dollars)? Explain your reasoning.



### Are you ready for more?

Come up with some strategies for mentally adding 15% to the total cost of an item.

## 14.3

## Expressing Percent Increase and Decrease

Complete the table so that each row has a description and two different expressions that answer the question asked in the description. The second expression should use only multiplication. Be prepared to explain how the two expressions are equivalent.

| description and question                                                                                                                                                                     | expression 1             | expression 2<br>(using only multiplication) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------|
| A one-night stay at a hotel in Anaheim, CA, costs \$160. Hotel room occupancy tax is 15%. What is the total cost of a one-night stay?                                                        | $160 + (0.15) \cdot 160$ |                                             |
| Teachers receive a 30% educators' discount at a museum. An adult ticket costs \$24. How much would a teacher pay for admission into the museum?                                              |                          | $(0.7) \cdot 24$                            |
| The population of a city was 842,000 ten years ago. The city now has 2% more people than it had then. What is the population of the city now?                                                |                          |                                             |
| After a major hurricane, 46% of the 90,500 households on an island lost their access to electricity. How many households still have electricity?                                             |                          |                                             |
|                                                                                                                                                                                              | $754 - (0.21) \cdot 754$ |                                             |
| Two years ago, the number of students in a school was 150. Last year, the student population increased 8%. This year, it increased about 8% again. What is the number of students this year? |                          |                                             |

## Lesson 14 Summary

We can write different expressions to calculate percent increase and decrease.

Suppose a new phone costs \$360 and is on sale at 25% off the regular price. One way to calculate this is to first find 25% of 360, which is 90, and then subtract \$90 from \$360 to get the sale price of \$270. These calculations can be recorded in this way:

$$360 - (0.25) \cdot 360 = 270$$

Another way to represent this calculation is to notice that subtracting 25% of the cost is equivalent to finding 75% of the cost. Using the distributive property, we know that  $360 - (0.25) \cdot 360$  can be rewritten as  $(1 - 0.25) \cdot 360$ , which is equal to  $(0.75) \cdot 360$ .