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## Unit 4, Lesson 11: Percentage Contexts

Let's learn about more situations that involve percentages.

### 11.1: Leaving a Tip

Which of these expressions represent a 15% tip on a \$20 meal? Which represent the total bill?

$$15 \cdot 20$$

$$20 + 0.15 \cdot 20$$

$$1.15 \cdot 20$$

$$\frac{15}{100} \cdot 20$$

### 11.2: A Car Dealership

A car dealership pays a wholesale price of \$12,000 to purchase a vehicle.

1. The car dealership wants to make a 32% profit.

a. By how much will they mark up the price of the vehicle?



b. After the markup, what is the retail price of the vehicle?

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2. During a special sales event, the dealership offers a 10% discount off of the retail price. After the discount, how much will a customer pay for this vehicle?

### **Are you ready for more?**

This car dealership pays the salesperson a bonus for selling the car equal to 6.5% of the sale price. How much commission did the salesperson lose when they decided to offer a 10% discount on the price of the car?

### **11.3: Commission at a Gym**

1. For each gym membership sold, the gym keeps \$42 and the employee who sold it gets \$8. What is the commission the employee earned as a percentage of the total cost of the gym membership?
  
2. If an employee sells a family pass for \$135, what is the amount of the commission they get to keep?

### **11.4: Card Sort: Percentage Situations**

Your teacher will give you a set of cards. Take turns with your partner matching a situation with a descriptor. For each match, explain your reasoning to your partner. If you disagree, work to reach an agreement.

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## Lesson 11 Summary

There are many everyday situations where a percentage of an amount of money is added to or subtracted from that amount, in order to be paid to some other person or organization:

	<b>goes to</b>	<b>how it works</b>
<b>sales tax</b>	the government	added to the price of the item
<b>gratuity (tip)</b>	the server	added to the cost of the meal
<b>interest</b>	the lender (or account holder)	added to the balance of the loan, credit card, or bank account
<b>markup</b>	the seller	added to the price of an item so the seller can make a profit
<b>markdown (discount)</b>	the customer	subtracted from the price of an item to encourage the customer to buy it
<b>commission</b>	the salesperson	subtracted from the payment that is collected

For example,

- If a restaurant bill is \$34 and the customer pays \$40, they left \$6 dollars as a tip for the server. That is 18% in \$34, so they left an 18% tip. From the customer's perspective, we can think of this as an 18% increase of the restaurant bill.
- If a realtor helps a family sell their home for \$200,000 and earns a 3% commission, then the realtor makes \$6,000, because  $(0.03) \cdot 200,000 = 6,000$ , and the family gets \$194,000, because  $200,000 - 6,000 = 194,000$ . From the family's perspective, we can think of this as a 3% decrease on the sale price of the home.

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## Unit 4, Lesson 11: Percentage Contexts

1. A car dealership pays \$8,350 for a car. They mark up the price by 17.4% to get the retail price. What is the retail price of the car at this dealership?
  2. A store has a 20% off sale on pants. With this discount, the price of one pair of pants before tax is \$15.20. What was the original price of the pants?
    - A. \$3.04
    - B. \$12.16
    - C. \$18.24
    - D. \$19.00
  3. Lin is shopping for a couch with her dad and hears him ask the salesperson, "How much is your commission?" The salesperson says that her commission is  $5\frac{1}{2}\%$  of the selling price.
    - a. How much commission will the salesperson earn by selling a couch for \$495?
    - b. How much money will the store get from the sale of the couch?
  4. A college student takes out a \$7,500 loan from a bank. What will the balance of the loan be after one year (assuming the student has not made any payments yet):
    - a. if the bank charges 3.8% interest each year?
    - b. if the bank charges 5.3% interest each year?
- (from Unit 4, Lesson 9)
5. Match the situations with the equations.

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a. Mai slept for $x$ hours, and Kiran slept for $\frac{1}{10}$ less than that.	$y = 2.33x$	
	$y = 1.375x$	
b. Kiran practiced the piano for $x$ hours, and Mai practiced for $\frac{2}{5}$ less than that.	$y = 0.6x$	
c. Mai drank $x$ oz of juice and Kiran drank $\frac{4}{3}$ more than that.	$y = 0.9x$	
	$y = 0.75x$	
d. Kiran spent $x$ dollars and Mai spent $\frac{1}{4}$ less than that.	$y = 1.6x$	
	$y = 0.7x$	
e. Mai ate $x$ grams of almonds and Kiran ate 1.5 times more than that.	$y = 2.5x$	
f. Kiran collected $x$ pounds of recycling and Mai collected $\frac{3}{10}$ less than that.		
g. Mai walked $x$ kilometers and Kiran walked $\frac{3}{8}$ more than that.		
h. Kiran completed $x$ puzzles and Mai completed $\frac{3}{5}$ more than that.		

(from Unit 4, Lesson 5)