1. What does the expression 3(20 + 15) represent?

3 represents: friends

20 represents: tickets

15 represents: hats

2. Evaluate the expression in Exercise 1.

(20 + 15) = 35

35 × 3 = 105

3. What does the expression $3 \times 20 + 3 \times 15$ represent?

3×20 represents: total cost for tickets

3×15 represents: " " " bars

4. Evaluate the expression $3 \times 20 + 3 \times 15$.

$3 \times 20 = 60$

$3 \times 15 = 45$

$60 + 45 = 105$

Distribute!

GCF: 3

5. What do you notice about the answers to Exercises 2 and 4?

$3(20+15) = 3 \times 20 + 3 \times 15$

factoring

1. Find $9 \times 8\frac{2}{3}$ mentally. Show the steps you used. (Example 1) $9(8) + 9\left(\frac{2}{3}\right) = 78$

Use the Distributive Property to rewrite each algebraic expression. (Example 2)

2. $3(x + 1) =$ $3x + 3$

3. $5(x + 8) =$ $5x + 40$

4. $4(x + 6) =$ $4x + 24$

show your work.

Factor each expression. (Examples 4 and 5)

5. $25 + 60 =$ $5(5 + 12)$

6. $4x + 40 =$ $4(x + 10)$

7. **Financial Literacy** Six friends are going to the state fair. The cost of one admission is \$9.50, and the cost for one ride on the Ferris wheel is \$1.50. Write two equivalent expressions and then find the total cost. (Example 3)

$6(9.50 + 1.50) = 6 \times 9.50 + 6 \times 1.50$

8. **Building on the Essential Question** How can the Distributive Property help you to rewrite expressions?

Sample answer: You can rewrite a sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers with no common factor.

Find each product mentally. Show the steps you used. (Example 1)

1. $9 \times 44 =$

$9(40) + 9(4) = 396$

Show your work.

2. $4 \times 5\frac{1}{8} =$

$4(5) + 4\left(\frac{1}{8}\right) = 20\frac{1}{2}$

3 $7 \times 3.8 =$

$7(3) + 7(0.8) = 26.6$

Use the Distributive Property to rewrite each algebraic expression. (Example 2)

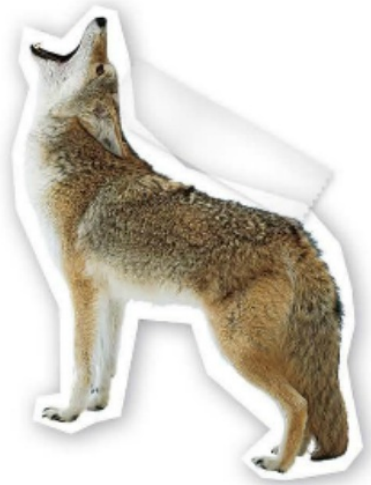
4. $8(x + 7) =$ $8x + 56$

5. $6(11 + x) =$ $66 + 6x$

6. $8(x + 1) =$ $8x + 8$

7 CCSS **Identify Repeated Reasoning** A coyote can run up to 43 miles per hour while a rabbit can run up to 35 miles per hour. Write two equivalent expressions and then find how many more miles a coyote can run in six hours than a rabbit at these rates. (Example 3)

6(43) − 6(35) = 6(43 − 35); 48 mi



Factor each expression. (Examples 4 and 5)

8. $8 + 16 =$ **8(1 + 2)**

9. $54 + 24 =$ **6(9 + 4)**

10. $63 + 81 =$ **9(7 + 9)**

11. $11x + 55 =$ **11(x + 5)**

12. $32 + 16x =$ **16(2 + x)**

13. $77x + 21 =$ **7(11x + 3)**

14. CCSS **Model with Mathematics** Refer to the graphic novel frame below for Exercises a–b.

a. Write two equivalent expressions that demonstrate the Distributive Property for the cost of x tickets for admission and movie passes on Family Night. **$x(7.00 + 7.50)$ and $x(7) + x(7.50)$**

b. Is it less expensive for a youth to pay regular admission with a movie pass or go on Family Night? Explain. **It is cheaper to pay regular admission. The total cost for one person is $13.50 versus $14.50 on Family Night.**

H.O.T. Problems Higher Order Thinking

15. **Persevere with Problems** Evaluate the expression 0.1(3.7) mentally. Justify your response using the Distributive Property. **0.37; Sample answer: 0.1(3.7) = 0.1(3) + 0.1(0.7) = 0.3 + 0.07 = 0.37**

16. **Identify Structure** Write two equivalent expressions involving decimals that illustrate the Distributive Property. **Sample answer: 3(4.8) and 3(4) + 3(0.8)**

17. **Construct an Argument** A friend rewrote the expression $5(x + 2)$ as $5x + 2$. Write a few sentences to your friend explaining the error. Then, rewrite the expression $5(x + 2)$ correctly. **Sample answer: The friend did not multiply 5 and 2. The expression $5(x + 2) = 5x + 10$.**

18. **Reason Inductively** Explain why $3(5x)$ is not equivalent to $(3 \cdot 5)(3 \cdot x)$. **Sample answer: The Distributive Property combines addition and multiplication. The expression $3(5x)$ is one term with three factors, and does not involve addition. So, $3(5x) = 15x$.**