Name: _____

Properties and Equivalent Expressions

Study the example showing how to use properties of operations to write equivalent expressions with variables. Then solve problems 1–9.
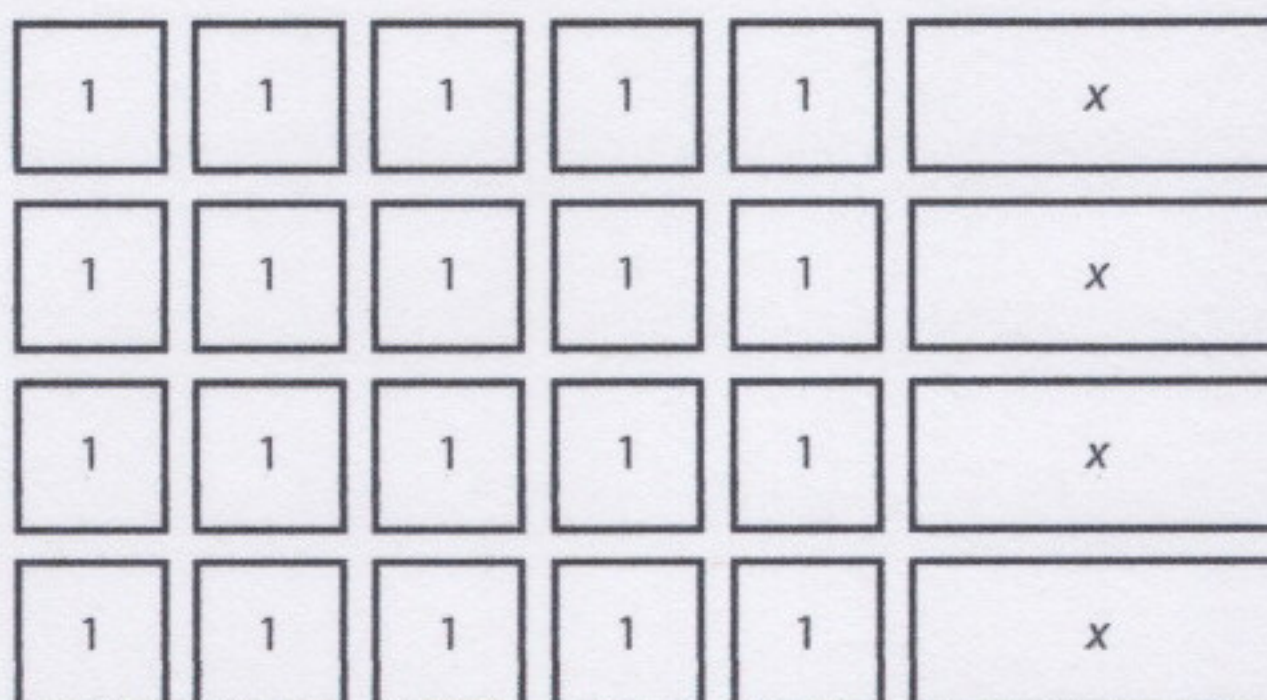
Example

Four students are buying tickets to a play. The tickets cost $5 each plus a service fee. The expression $4(5 + x)$ represents the total cost. Write an expression that is equivalent to $4(5 + x)$.

1	1	1	1	1	x
1	1	1	1	1	x
1	1	1	1	1	x
1	1	1	1	1	x

You can use math tiles to model $4(5 + x)$.

From the math tiles, you can see that the expression $4(5 + x) = (5 + 5 + 5 + 5) + (x + x + x + x)$.

1 Explain how the model shows $4(5 + x)$.

_____

2 Simplify the expression in the example. _____

3 What are the factors in the expression $4(5 + x)$? _____

4 Show how to use the distributive property to simplify $4(5 + x)$.

_____

_____

5 Are the expressions $(5 + 5 + 5 + 5) + (x + x + x + x)$ and $4(5 + x)$ equivalent? If so, write another expression that is equivalent to both of them. If not, explain why not.

_____

_____

Solve.

6 Use the distributive property to find two expressions that are equivalent to $7(3x - 4)$.

_____

_____

7 A rectangular play area is 8 yards long. The expression $56 + 8x$ represents the area of the play area in square yards. What expression represents the width of the play area in yards? Draw a picture to model the problem.

Show your work.

Solution: _____

8 Use the distributive property to write two expressions that are equivalent to $12 + 30x$. Describe the steps you follow to find the expressions.

_____

_____

_____

9 Are $9(4 - x)$ and $36 - 9x$ equivalent expressions? Explain how you know.

_____

_____