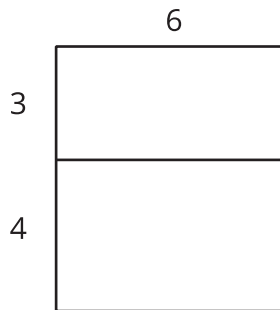# Unit 6 Lesson 8: Equivalent Quadratic Expressions

1 Diagrams of Products (Warm up)

**Student Task Statement**

6

3

4

1. Explain why the diagram shows that $6(3 + 4) = 6 \cdot 3 + 6 \cdot 4$.

2. Draw a diagram to show that $5(x + 2) = 5x + 10$.

2 Drawing Diagrams to Represent More Products

Student Task Statement

Applying the distributive property to multiply out the factors of, or expand, $4(x+2)$ gives us $4x+8$, so we know the two expressions are equivalent. We can use a rectangle with side lengths $(x+2)$ and 4 to illustrate the multiplication.
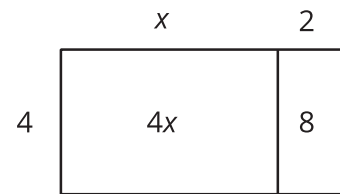
1. Draw a diagram to show that $n(2n+5)$ and $2n^2+5n$ are equivalent expressions.

2. For each expression, use the distributive property to write an equivalent expression. If you get stuck, consider drawing a diagram.

   a. $6\left(\frac{1}{3}n+2\right)$ b. $p(4p+9)$ c. $5r\left(r+\frac{3}{5}\right)$ d. $(0.5w+7)w$

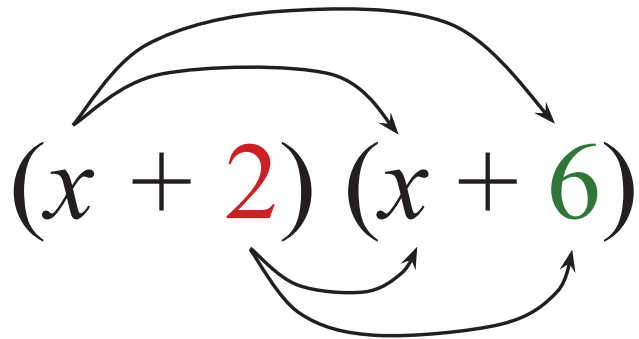# 3 Using Diagrams to Find Equivalent Quadratic Expressions
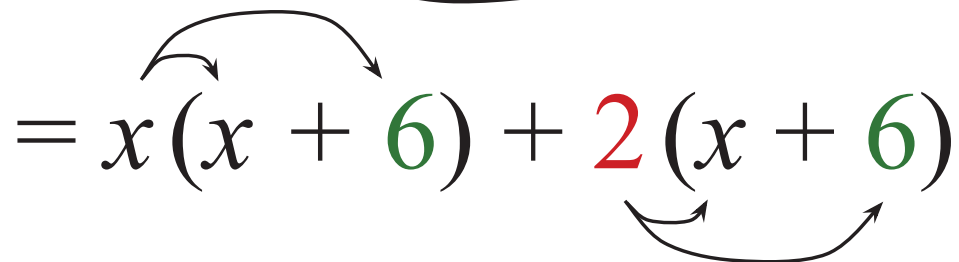
Student Task Statement

1. Here is a diagram of a rectangle with side lengths $x + 1$ and $x + 3$. Use this diagram to show that $(x + 1)(x + 3)$ and $x^2 + 4x + 3$ are equivalent expressions.

	x	3
x		
1		
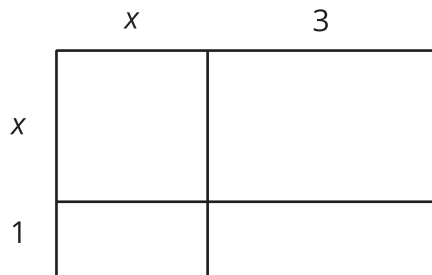
2. Draw diagrams to help you write an equivalent expression for each of the following:
   a. $(x + 5)^2$

   b. $2x(x + 4)$

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

   d. $(x + m)(x + n)$

3. Write an equivalent expression for each expression without drawing a diagram:
   a. $(x + 2)(x + 6)$

   b. $(x + 5)(2x + 10)$

Activity Synthesis

$$(x + 2)(x + 6)$$

$$= x(x + 6) + 2(x + 6)$$

$$= x^2 + 6x + 2x + (2)(6)$$

$$= x^2 + (6+2)x + (2)(6)$$