## Unit 6 Lesson 8: Equivalent Quadratic Expressions

### 1 Diagrams of Products (Warm up)

#### Student Task Statement



1. Explain why the diagram shows that $6\left(3+4\right)=6⋅3+6⋅4$.
2. Draw a diagram to show that $5\left(x+2\right)=5x+10$.

### 2 Drawing Diagrams to Represent More Products

#### Student Task Statement

Applying the distributive property to multiply out the factors of, or expand, $4\left(x+2\right)$ gives us $4x+8$, so we know the two expressions are equivalent. We can use a rectangle with side lengths $\left(x+2\right)$ and 4 to illustrate the multiplication.



1. Draw a diagram to show that $n\left(2n+5\right)$ 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. $p\left(4p+9\right)$
* c. $5r\left(r+\frac{3}{5}\right)$
* d. $\left(0.5w+7\right)w$

### 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 $\left(x+1\right)\left(x+3\right)$ and $x^{2}+4x+3$ are equivalent expressions.
* 
1. Draw diagrams to help you write an equivalent expression for each of the following:
	1. $\left(x+5\right)^{2}$
	2. $2x\left(x+4\right)$
	3. $\left(2x+1\right)\left(x+3\right)$
	4. $\left(x+m\right)\left(x+n\right)$
2. Write an equivalent expression for each expression without drawing a diagram:
	1. $\left(x+2\right)\left(x+6\right)$
	2. $\left(x+5\right)\left(2x+10\right)$

#### Activity Synthesis





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