

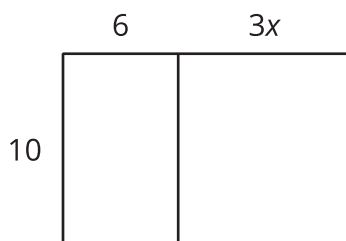


Expanding and Factoring

Let's use the distributive property to write expressions in different ways.

19.1 Expressions for Area

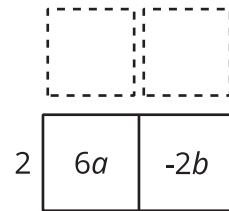
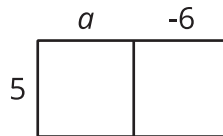
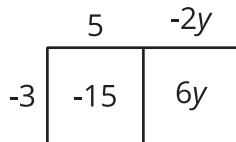
Write as many expressions as you can that represent the area of this rectangle.



19.2

Factoring and Expanding with Negative Numbers

In each row, write the equivalent expression. If you get stuck, use a diagram to organize your work. The first row is provided as an example. Diagrams are provided for the first three rows.



factored	expanded
$-3(5 - 2y)$	$-15 + 6y$
$5(a - 6)$	
	$6a - 2b$
$-4(2w - 5z)$	
$-(2x - 3y)$	
	$20x - 10y + 15z$
$k(4 - 17)$	
	$10a - 13a$
$-2x(3y - z)$	
	$ab - bc - 3bd$
$-x(3y - z + 4w)$	



Are you ready for more?

1. Expand to create an equivalent expression that uses the fewest number of terms: $\left(\left(\left(x + 1\right) \frac{1}{2}\right) + 1\right) \frac{1}{2} + 1$.
2. If we wrote a new expression following the same pattern so that there were 20 sets of parentheses, how could it be expanded into an equivalent expression that uses the fewest number of terms?

19.3 Seeing Structure

Factor each expression. Be prepared to explain your reasoning.

1. $3 \cdot 15 + 4 \cdot 15 - 5 \cdot 15$

2. $3x + 4x - 5x$

3. $3(x - 2) + 4(x - 2) - 5(x - 2)$

4. $3\left(\frac{5}{2}x + 6\frac{1}{2}\right) + 4\left(\frac{5}{2}x + 6\frac{1}{2}\right) - 5\left(\frac{5}{2}x + 6\frac{1}{2}\right)$



The terms of the product go inside:

$$\begin{array}{|c|c|} \hline & \\ \hline 4 & 12x \quad -8 \\ \hline \end{array}$$

	$3x$	-2
4	$12x$	-8