## Lesson 8: Expanding and Factoring

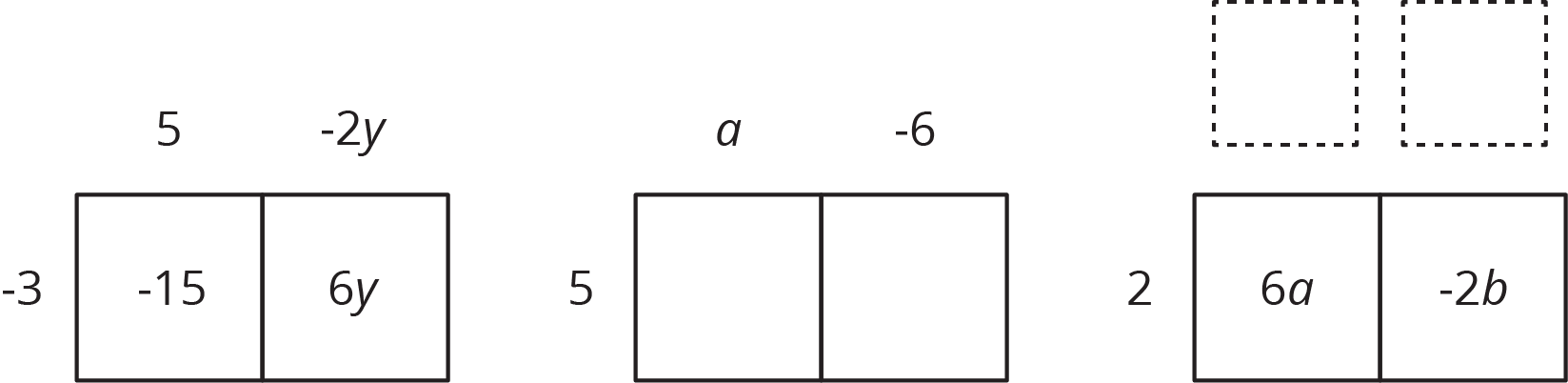
Let's use the distributive property to write expressions in different ways.

### 8.1: Number Talk: Parentheses

Find the value of each expression mentally.

### 8.2: 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 |
| --- | --- |
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#### Are you ready for more?

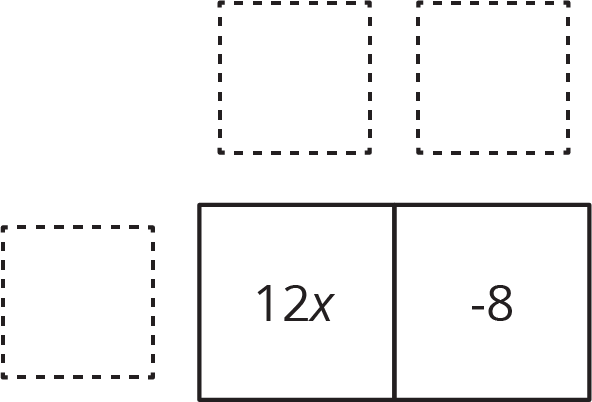
Expand to create an equivalent expression that uses the fewest number of terms: . If we wrote a new expression following the same pattern so that there were 20 sets of parentheses, how could it be expanded into an equivalent expression that uses the fewest number of terms?

### Lesson 8 Summary

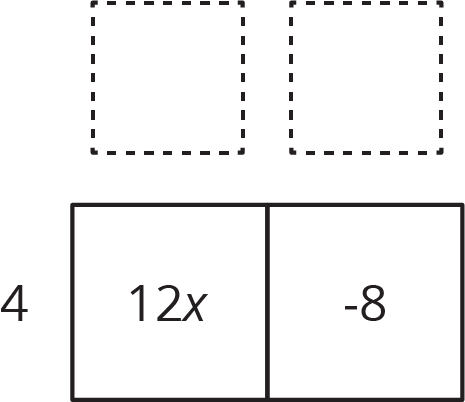
We can use properties of operations in different ways to rewrite expressions and create equivalent expressions. We have already seen that we can use the distributive property to **expand** an expression, for example . We can also use the distributive property in the other direction and **factor** an expression, for example .

We can organize the work of using distributive property to rewrite the expression . In this case we know the product and need to find the factors.

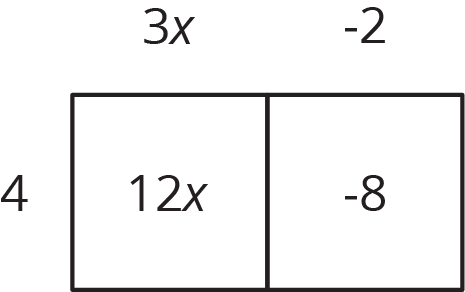
The terms of the product go inside:



We look at the expressions and think about a factor they have in common. and each have a factor of 4. We place the common factor on one side of the large rectangle:



Now we think: "4 times *what* is 12?" "4 times *what* is -8?" and write the other factors on the other side of the rectangle:



So, is equivalent to .



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