## Lesson 8: Reasoning about Solving Equations (Part 2)

Let’s use hangers to understand two different ways of solving equations with parentheses.

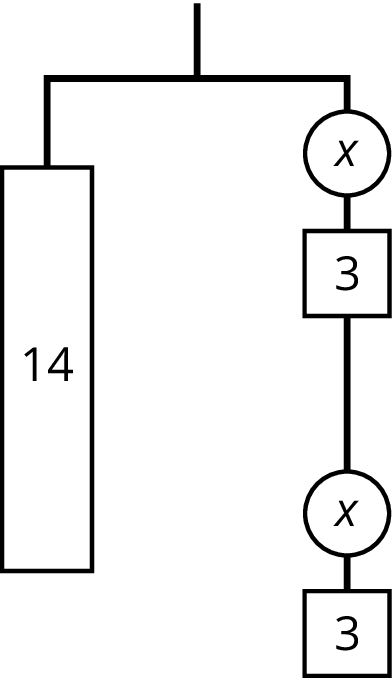
### 8.1: Equivalent to

Select **all** the expressions equivalent to .



### 8.2: Either Or

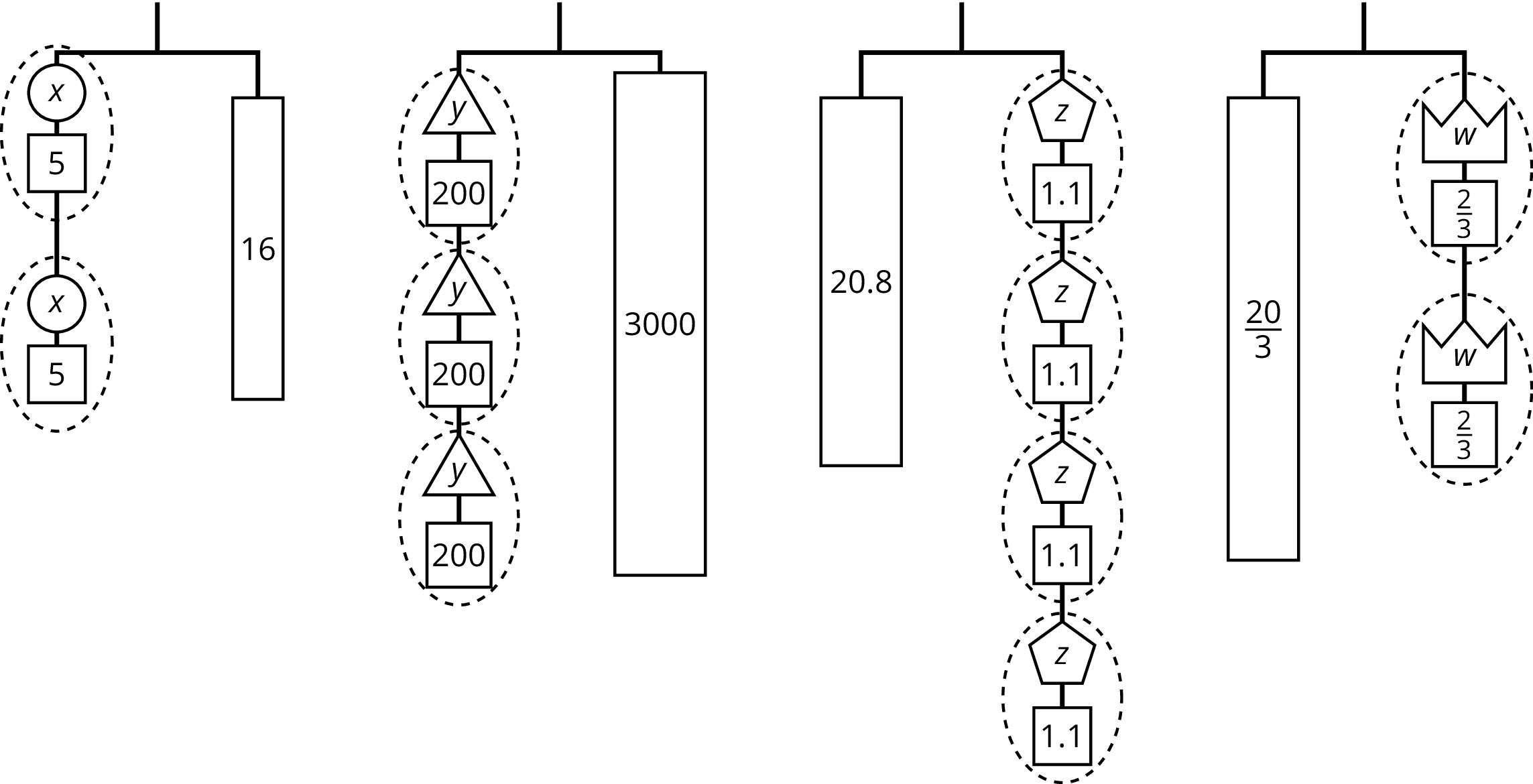
1. Explain why either of these equations could represent this hanger:

* 
* or

1. Find the weight of one circle. Be prepared to explain your reasoning.

### 8.3: Use Hangers to Understand Equation Solving, Again

Here are some balanced hangers. Each piece is labeled with its weight.



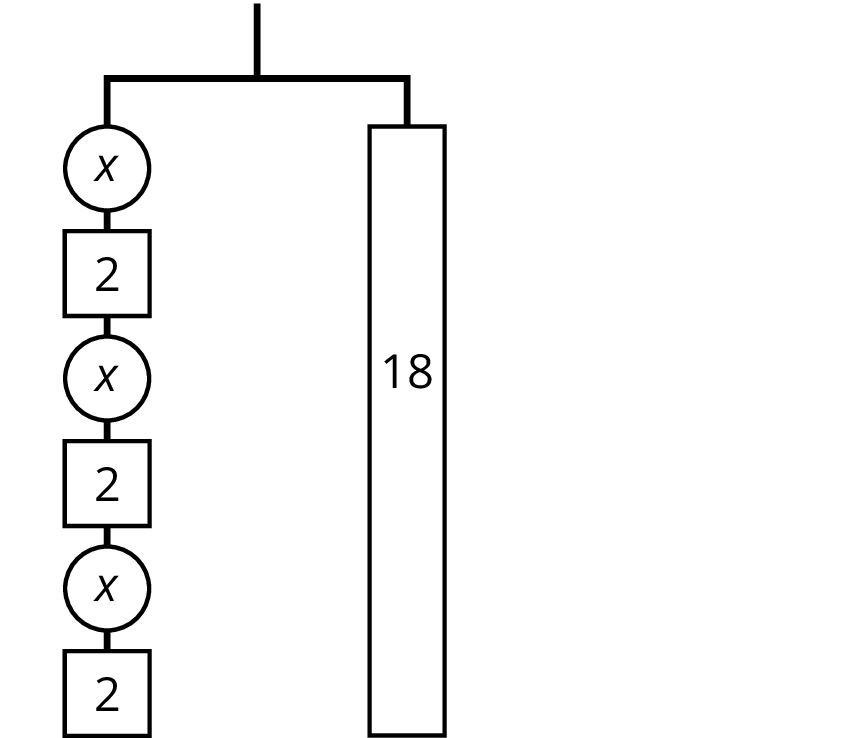
For each diagram:

1. Assign one of these equations to each hanger:
2. Explain how to figure out the weight of a piece labeled with a letter by reasoning about the diagram.
3. Explain how to figure out the weight of a piece labeled with a letter by reasoning about the equation.

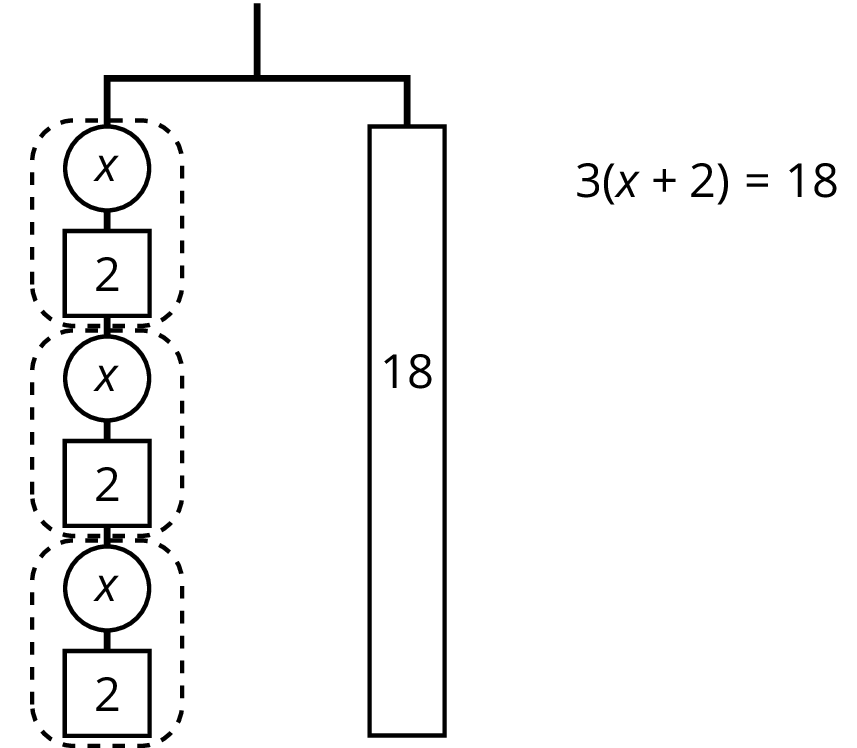
### Lesson 8 Summary

The balanced hanger shows 3 equal, unknown weights and 3 2-unit weights on the left and an 18-unit weight on the right.

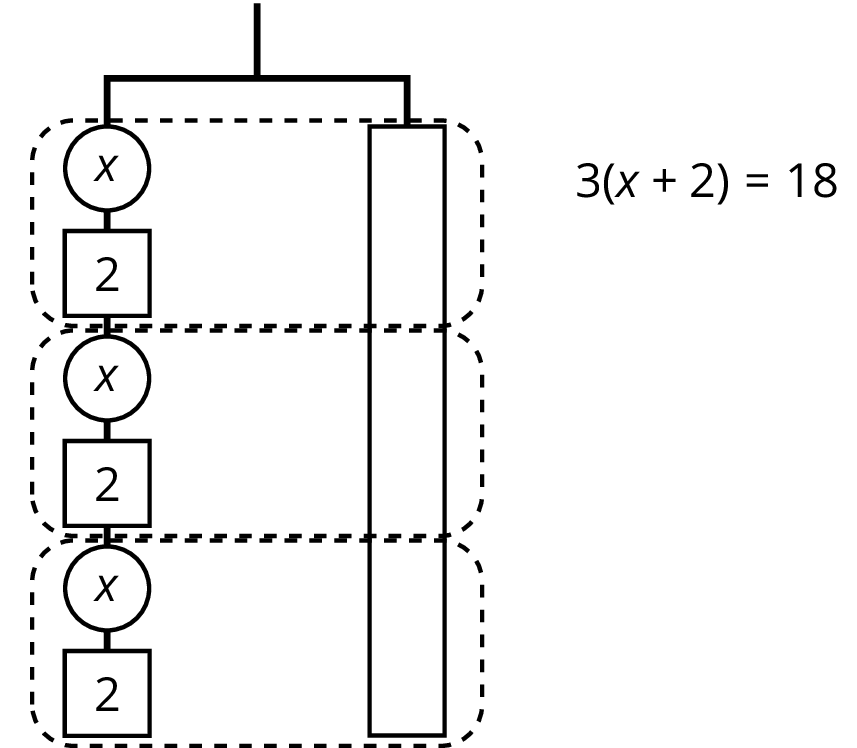
There are 3 unknown weights plus 6 units of weight on the left. We could represent this balanced hanger with an equation and solve the equation the same way we did before.



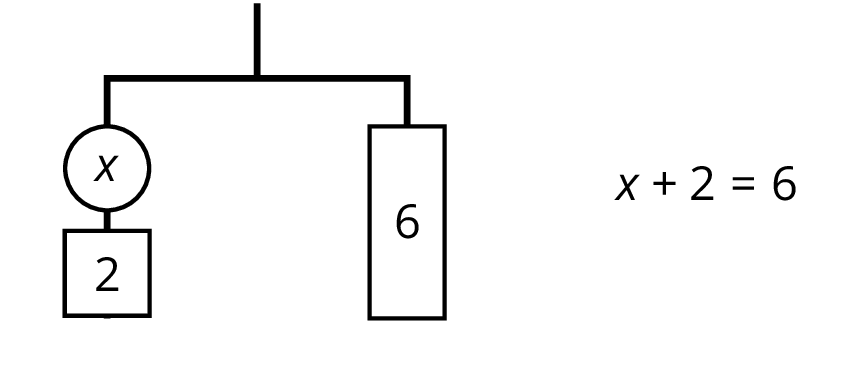
Since there are 3 groups of on the left, we could represent this hanger with a different equation: .



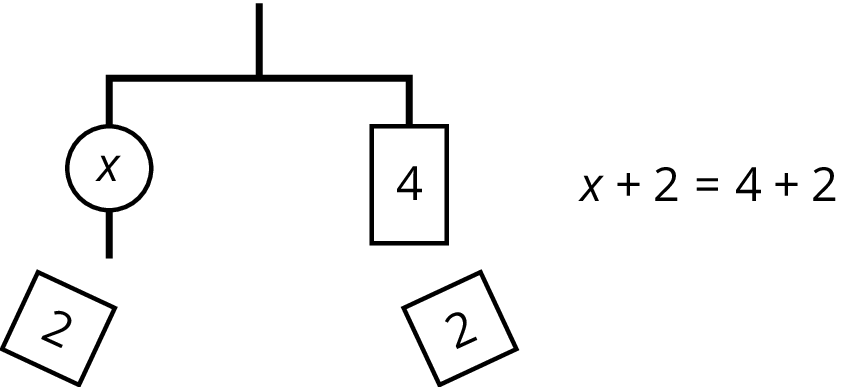
The two sides of the hanger balance with these weights: 3 groups of on one side, and 18, or 3 groups of 6, on the other side.



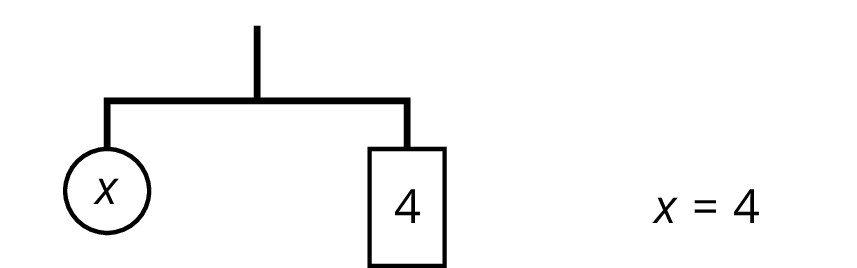
The two sides of the hanger will balance with  of the weight on each side: .



We can remove 2 units of weight from each side, and the hanger will stay balanced. This is the same as subtracting 2 from each side of the equation.



An equation for the new balanced hanger is . This gives the solution to the original equation.



Here is a concise way to write the steps above:



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