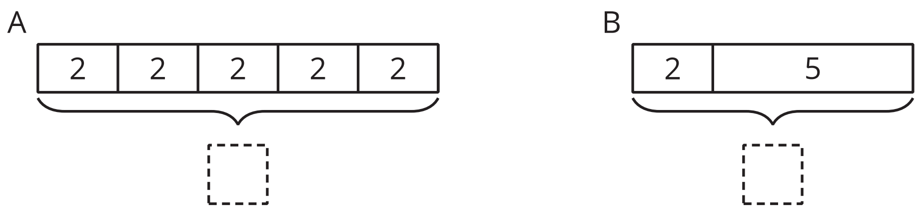
Tape Diagrams and Equations

Let's recall how tape diagrams and equations can show relationships between amounts.

1.1 Which Diagram Is Which?

1. Here are two diagrams. One represents $2 + 5 = 7$. The other represents $5 \cdot 2 = 10$. Which is which? Label each diagram with the value that represents the total.



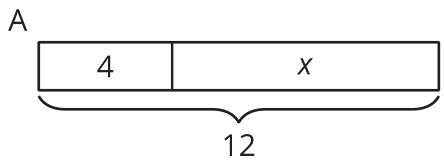
2. Draw a diagram that represents each equation.

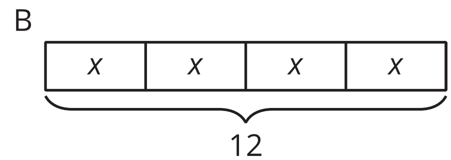
$4 + 3 = 7$

$4 \cdot 3 = 12$

1.2 Match Equations and Tape Diagrams

Here are two tape diagrams. Match each equation to one of the tape diagrams.





- $4 + x = 12$
- $12 \div 4 = x$
- $4 \cdot x = 12$
- $12 = 4 + x$
- $12 - x = 4$
- $12 = 4 \cdot x$
- $12 - 4 = x$
- $x = 12 - 4$
- $x + x + x + x = 12$

1.3 Draw Diagrams for Equations

For each equation, draw a diagram that represents the same relationship. Then explain what the letters x and y represent in the relationships.

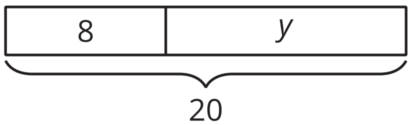
1. $18 = 3 + x$

2. $18 = 3 \cdot y$

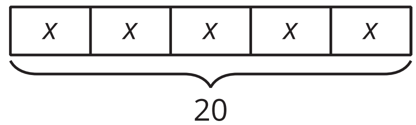
Are you ready for more?

Which diagram can be represented by more equations? Explain or show your reasoning.

A



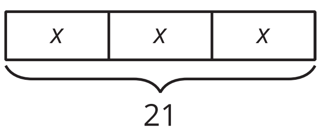
B



Lesson 1 Summary

Tape diagrams can help us understand relationships between quantities and how operations describe those relationships.

A



B

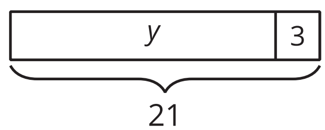


Diagram A has 3 parts that add to 21. Each part is labeled with the same letter, so we know the 3 parts are equal. Here are some equations that all represent Diagram A:

$$x + x + x = 21$$

$$3 \cdot x = 21$$

$$x = 21 \div 3$$

$$x = \frac{1}{3} \cdot 21$$

Notice that the number 3 is in the equations, but it's not written in the diagram. The 3 comes from counting 3 boxes representing 3 equal parts in 21.

Diagram B has 2 parts that add to 21. Here are some equations that all represent Diagram B:

$$y + 3 = 21$$

$$y = 21 - 3$$

$$3 = 21 - y$$