## Unit 3 Lesson 4: Reasoning about Equations and Tape Diagrams (Part 1)

### 1 Algebra Talk: Seeing Structure (Warm up)

#### Student Task Statement

Find a solution to each equation without writing anything down.

$x+1=5$

$2(x+1)=10$

$3(x+1)=15$

$500=100(x+1)$

### 2 Situations and Diagrams

#### Student Task Statement

Draw a tape diagram to represent each situation. For some of the situations, you need to decide what to represent with a variable.

1. Diego has 7 packs of markers. Each pack has $x$ markers in it. After Lin gives him 9 more markers, he has a total of 30 markers.
2. Elena is cutting a 30-foot piece of ribbon for a craft project. She cuts off 7 feet, and then cuts the remaining piece into 9 equal lengths of $x$ feet each.
3. A construction manager weighs a bundle of 9 identical bricks and a 7-pound concrete block. The bundle weighs 30 pounds.
4. A skating rink charges a group rate of $9 plus a fee to rent each pair of skates. A family rents 7 pairs of skates and pays a total of $30.
5. Andre bakes 9 pans of brownies. He donates 7 pans to the school bake sale and keeps the rest to divide equally among his class of 30 students.

### 3 Situations, Diagrams, and Equations

#### Student Task Statement

Each situation in the previous activity is represented by one of the equations.

* $7x+9=30$
* $30=9x+7$
* $30x+7=9$
1. Match each situation to an equation.
2. Find the solution to each equation. Use your diagrams to help you reason.
3. What does each solution tell you about its situation?



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