



## Vocabulary

### Review

Draw an example of each.

1. *point*

2.  $\overleftrightarrow{AB}$

3.  $\overrightarrow{DF}$

### Vocabulary Builder

**segment** (noun) SEG munt

**Definition:** A **segment** is part of a line that consists of two endpoints and all points between them.

**Main Idea:** You name a **segment** by its endpoints.

segment HJ



### Use Your Vocabulary

Complete each sentence with *endpoint*, *endpoints*, *line*, or *points*.

4. A *ray* has one ?.

5. A *line* contains infinitely many ?.

6. A *segment* has two ?.

7. A *segment* is part of a ?.

Place a check  $\checkmark$  if the phrase describes a *segment*. Place an  $\times$  if it does not.

8. Earth's equator

9. the right edge of a book's cover

10. one side of a triangle

Take note

### Postulate 1-5 Ruler Postulate

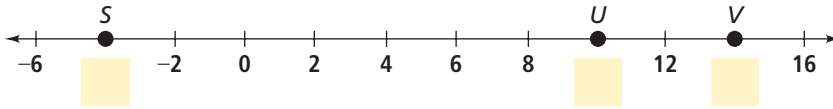
Every point on a line can be paired with a real number, called the *coordinate* of the point.



### Problem 1 Measuring Segment Lengths

**Got It?** What are  $UV$  and  $SV$  on the number line?

11. Label each point on the number line with its coordinate.



12. Find  $UV$  and  $SV$ . Write a justification for each statement.

$UV =   \quad - \quad  $	<hr/> <hr/>	$SV =   \quad - \quad  $
$UV =   \quad  $	<hr/> <hr/>	$SV =   \quad  $
$UV = \quad$	<hr/> <hr/>	$SV = \quad$



### Postulate 1-6 Segment Addition Postulate

If three points  $A$ ,  $B$ , and  $C$  are collinear and  $B$  is between  $A$  and  $C$ , then  $AB + BC = AC$ .

Given points  $A$ ,  $B$ , and  $C$  are collinear and  $B$  is between  $A$  and  $C$ , complete each equation.

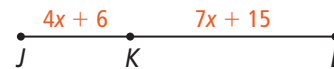
13.  $AB = 5$  and  $BC = 4$ , so  $AB + BC = \quad + \quad$  and  $AC = \quad$ .

14.  $AC = 12$  and  $BC = 7$ , so  $AC - BC = \quad - \quad$  and  $AB = \quad$ .



### Problem 2 Using the Segment Addition Postulate

**Got It?** In the diagram,  $JL = 120$ . What are  $JK$  and  $KL$ ?



15. Write a justification for each statement.

$JK + KL = JL$  

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$(4x + 6) + (7x + 15) = 120$  

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$11x + 21 = 120$  

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$11x = 99$  

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$x = 9$  

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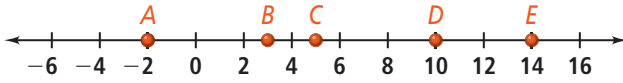
16. You know that  $JK = 4x + 6$  and  $KL = 7x + 15$ . Use the value of  $x$  from Exercise 15 to find  $JK$  and  $KL$ . Find  $JK$  and  $KL$ .

17.  $JK = \quad$  and  $KL = \quad$ .



### Problem 3 Comparing Segment Lengths

**Got It?** Use the diagram below. Is  $\overline{AB}$  congruent to  $\overline{DE}$ ?



In Exercises 18 and 19, circle the expression that completes the equation.

18.  $AB = \blacksquare$

- $-2 - 2$      
   $|-2 - 2|$      
   $|-2 - 3|$      
   $|-2 - 4|$

19.  $DE = \blacksquare$

- $3 - 14$      
   $10 + 14$      
   $|5 - 14|$      
   $|10 - 14|$

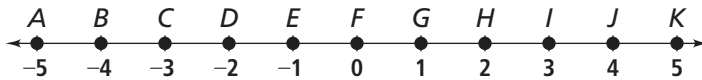
20. After simplifying,  $AB = \blacksquare$  and  $DE = \blacksquare$ .

21. Is  $\overline{AB}$  congruent to  $\overline{DE}$ ? Explain.

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The *midpoint* of a segment is the point that divides the segment into two congruent segments.

Use the number line below for Exercises 22–25.



22. Point  $\blacksquare$  is halfway between points B and J.      23. The midpoint of  $\overline{AE}$  is point  $\blacksquare$ .

24. Point  $\blacksquare$  divides  $\overline{EK}$  into two congruent segments.

25. Find the midpoint of each segment. Then write the coordinate of the midpoint.

	$\overline{AG}$	$\overline{DH}$	$\overline{AK}$
Midpoint	$\blacksquare$	$\blacksquare$	$\blacksquare$
Coordinate	$\blacksquare$	$\blacksquare$	$\blacksquare$

26. Find the coordinate of the midpoint of each segment.

	segment with endpoints at $-4$ and $2$	segment with endpoints at $-2$ and $4$
Coordinate of midpoint	$\blacksquare$	$\blacksquare$

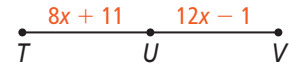
27. Circle the expression that relates the coordinate of the midpoint to the coordinates of the endpoints.

- $x_1 + x_2$      
   $\frac{(x_1 + x_2)}{2}$      
   $\frac{(x_1 - x_2)}{2}$



## Problem 4 Using the Midpoint

**Got It?**  $U$  is the midpoint of  $\overline{TV}$ . What are  $TU$ ,  $UV$ , and  $TV$ ?



28. Use the justifications at the right to complete the steps below.

**Step 1** Find  $x$ .

$$\begin{array}{rcl}
 TU = UV & & \text{Definition of midpoint} \\
 8x + 11 = \square & & \text{Substitute.} \\
 8x + 11 + \square = \square + \square & & \text{Add 1 to each side.} \\
 \square = \square & & \text{Subtract } 8x \text{ from each side.} \\
 \square = x & & \text{Divide each side by 4.}
 \end{array}$$

**Step 2** Find  $TU$  and  $UV$ .

$$\begin{array}{rcl}
 TU = 8 \cdot \square + 11 = \square & & \text{Substitute } \square \text{ for } x. \\
 UV = 12 \cdot \square - 1 = \square & & \text{Substitute.}
 \end{array}$$

**Step 3** Find  $TV$ .

$$\begin{array}{rcl}
 TV = TU + UV & & \text{Definition of midpoint} \\
 = \square + \square & & \text{Substitute.} \\
 = \square & & \text{Simplify.}
 \end{array}$$

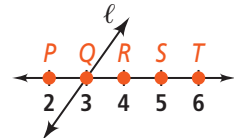


## Lesson Check • Do you UNDERSTAND?

**Vocabulary** Name two segment bisectors of  $\overline{PR}$ .

**Underline the correct word or symbol to complete each sentence.**

- A bisector / midpoint may be a point, line, ray, or segment.
- The midpoint of  $\overline{PR}$  is point  $P/Q/R$ .
- Line  $\ell$  passes through point  $P/Q/R$ .
- Two bisectors of  $\overline{PR}$  are        and       .



## Math Success

Check off the vocabulary words that you understand.

- congruent segments     
  coordinate     
  midpoint     
  segment bisector

Rate how well you can *find lengths of segments*.

