Name_____ Date _____

1.2 Measuring and Constructing Segments

For use with Exploration 1.2

Essential Question How can you measure and construct a line segment?

1 EXPLORATION: Measuring Line Segments Using Nonstandard Units

Work with a partner.

a. Draw a line segment that has a length of 6 inches.

b. Use a standard-sized paper clip to measure the length of the line segment. Explain how you measured the line segment in "paper clips."

c. Write conversion factors from paper clips to inches and vice versa.

1 paper clip = ____ in.

1 in. = ____ paper clip

d. A *straightedge* is a tool that you can use to draw a straight line. An example of a straightedge is a ruler. Use only a pencil, straightedge, paper clip, and paper to draw another line segment that is 6 inches long. Explain your process.

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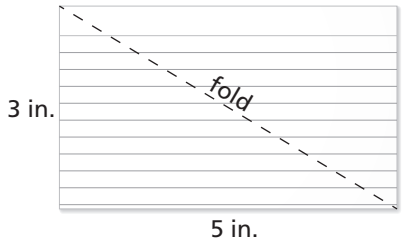
1.2 Measuring and Constructing Segments (continued)

2 EXPLORATION: Measuring Line Segments Using Nonstandard Units

Work with a partner.

a. Fold a 3-inch by 5-inch index card on one of its diagonals.

b. Use the Pythagorean Theorem to algebraically determine the length of the diagonal in inches. Use a ruler to check your answer.



c. Measure the length and width of the index card in paper clips.

d. Use the Pythagorean Theorem to algebraically determine the length of the diagonal in paper clips. Then check your answer by measuring the length of the diagonal in paper clips. Does the Pythagorean Theorem work for any unit of measure? Justify your answer.

3 EXPLORATION: Measuring Heights Using Nonstandard Units

Work with a partner. Consider a unit of length that is equal to the length of the diagonal you found in Exploration 2. Call this length "1 diag." How tall are you in diags? Explain how you obtained your answer.

Communicate Your Answer

4. How can you measure and construct a line segment?

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1.2 Notetaking with Vocabulary

For use after Lesson 1.2

In your own words, write the meaning of each vocabulary term.

postulate

axiom

coordinate

distance

construction

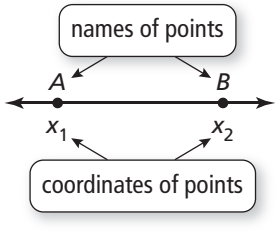
congruent segments

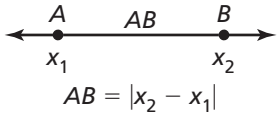
between

Postulate 1.1 Ruler Postulate

The points on a line can be matched one to one with the real numbers. The real number that corresponds to a point is the **coordinate** of the point.

The **distance** between points A and B, written as AB, is the absolute value of the difference of the coordinates of A and B.





$AB = |x_2 - x_1|$

Notes:

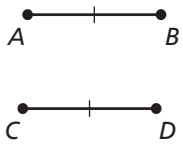
Name _____ Date _____

1.2 Notetaking with Vocabulary (continued)

Core Concepts

Congruent Segments

Line segments that have the same length are called **congruent segments**. You can say "the length of $\overline{AB}$ is equal to the length of $\overline{CD}$," or you can say "$\overline{AB}$ *is congruent to* $\overline{CD}$." The symbol $\cong$ means "is congruent to."



Lengths are equal.

$AB = CD$

"is equal to"

Segments are congruent.

$\overline{AB} \cong \overline{CD}$

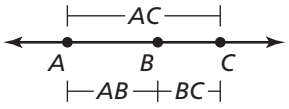
"is congruent to"

Notes:

Postulate 1.2 Segment Addition Postulate

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

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



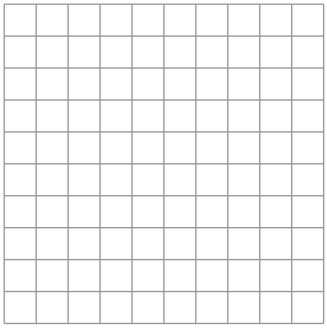
Notes:

1.2 Notetaking with Vocabulary (continued)

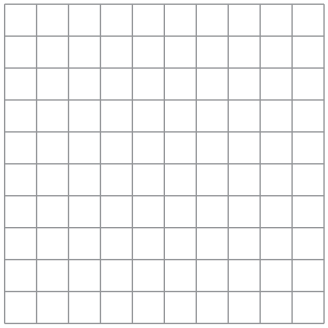
Extra Practice

In Exercises 1–3, plot the points in the coordinate plane. Then determine whether $\overline{AB}$ and $\overline{CD}$ are congruent.

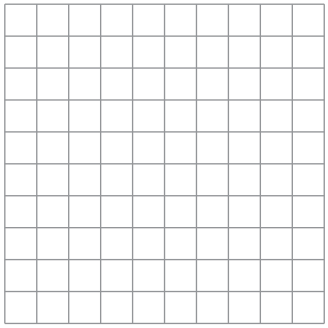
1. $A(-5, 5), B(-2, 5)$
$C(2, -4), D(-1, -4)$



2. $A(4, 0), B(4, 3)$
$C(-4, -4), D(-4, 1)$

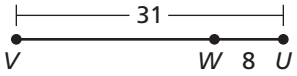


3. $A(-1, 5), B(5, 5)$
$C(1, 3), D(1, -3)$

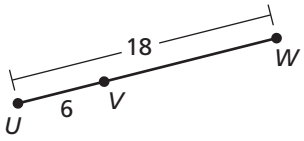


In Exercises 4–6, find *VW*.

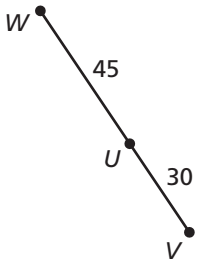
4.



5.



6.



7. A bookstore and a movie theater are 6 kilometers apart along the same street. A florist is located between the bookstore and the theater on the same street. The florist is 2.5 kilometers from the theater. How far is the florist from the bookstore?