Lesson 1.2 Line Segments

Sunday, August 20, 2023 10:00 PM

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Lesson 1.2
Line

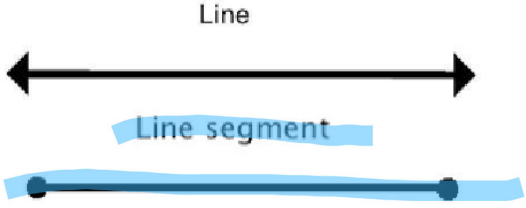
Lesson 1.2 Line Segments

MA.912.GR.5.1
Construct a copy of a segment or an angle.

Content Objective
Students will calculate measures of line segments.

Learn
Betweenness of Points

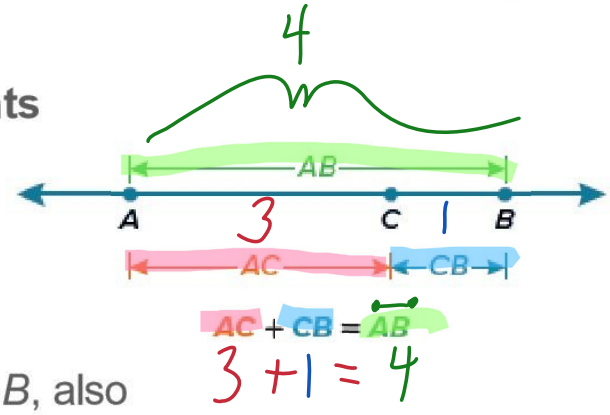
A **line segment** is a measurable part of a line that consists of two points, called endpoints, and all of the points between them. The two endpoints are used to name the segment.



Learn
Betweenness of Points

Key Concept: Betweenness of Points

Point *C* is between *A* and *B* if and only if *A*, *B*, and *C* are collinear and *AC* + *CB* = *AB*.

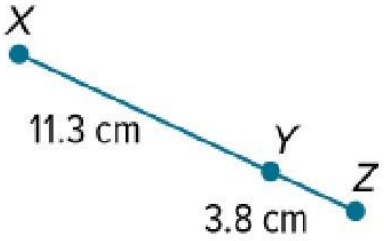


In the example above, line segment *AB*, also written $\overline{AB}$, has endpoints *A* and *B* and contains point *C*. *AB* is the measure of $\overline{AB}$, *AC* is the measure of $\overline{AC}$, and *CB* is the measure of $\overline{CB}$.

Example 1
Find Measurements by Adding

Find the measure of $\overline{XZ}$.

$$\begin{array}{r} 11.3 \\ +\ 3.8 \\ \hline 15.1 \end{array}$$



Example 2
Find Measurements by Subtracting

Find the measure of QR.

4 8 16

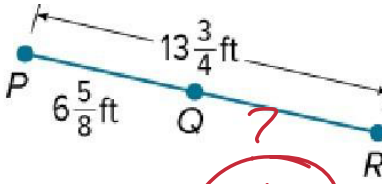
8 16

$13 - 6 = 7$

$\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}$

$\frac{5}{8} \times \frac{1}{1} = \frac{5}{8}$

$7\ \frac{1}{8}$



$7\frac{1}{8}$

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Example 3

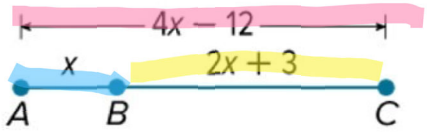
Write and Solve Equations to Find Measurements

Find the value of x and BC if B is between A and C, $AC = 4x - 12$, $AB = x$, and $BC = 2x + 3$.

Step 1 Sketch two points and label them A and C. Connect the points.

Step 2 Sketch point B between points A and C.

Step 3 Label segments AB, BC, and AC with their given measures.



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Example 3

Write and Solve Equations to Find Measurements

Step 4 Use betweenness of points to write an equation and solve for x.

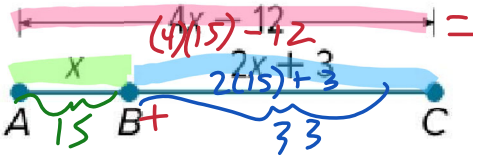
Betweenness of points

$AC = AB + BC$

$4x - 12 = x + 2x + 3$

$4x - 12 = 3x + 3$

$-3x \quad -3x$



$1x - 12 = 3$

$+12 \quad +12$

$1x - 12 = 3$

$x = 15$

Step 5 Find *all the lengths to prove:*

AB = 15 ***BC*** = 33 ***AC*** = 48

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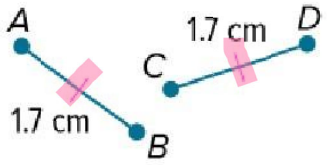
Learn
Line Segment Congruence

If two geometric figures have exactly the same shape and size, then they are **congruent**. Two segments that have the same measure are **congruent segments**.

Key Concept: Congruent Segments

≅ is read *is congruent to*. Tick marks on the figure also indicate congruence. Use a consecutive number of tick marks for each new pair of congruent segments in a figure.



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Example 5
Write and Solve Equations by Using Congruence

Find the value of *x*.

8 8

$6(-2)+20$ $2(-2+6)$ $2(4)$

$6x + 20 = 2x + 12$

$-2x \quad -2x$

$4x + 20 = 12$

$-20 \quad -20$

$\frac{4x}{4} = \frac{-8}{4}$ $x = -2$

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