Lesson 1.2 Line Segments

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Lesson 1.2 Line

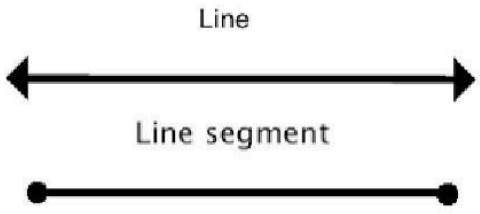
Lesson 1.2 Line Segments

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

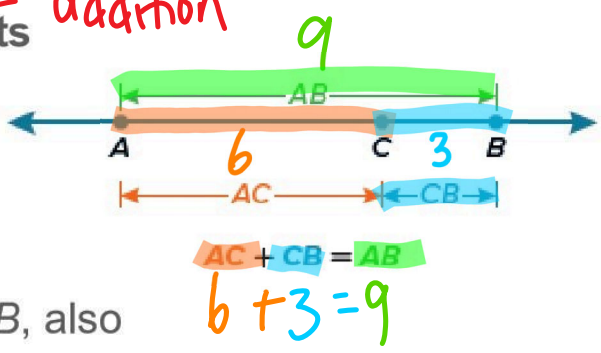
A **line segment** is a measurable part of a line that consists of two points, called endpoints, and all the points between them. The two endpoints are used to name the segment.



Learn
Betweenness of Points

Key Concept: Betweenness of Points segment addition

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



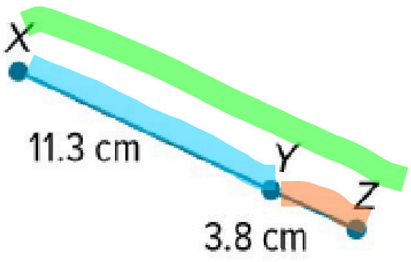
In the example above, line segment *AB*, also written $\overline{AB}$, has endpoints *A* and *B* and contains point *C*. *AB* is the measure of $\overline{AB}$, *AC* is the measure of $\overline{AC}$, and *CB* is the measure of $\overline{CB}$.

Example 1
Find Measurements by Adding

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

$XY + YZ = XZ$

$11.3 + 3.8 = 15.1$



Example 2
Find Measurements by Subtracting

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

$13\frac{3}{4} - 6\frac{5}{8}$

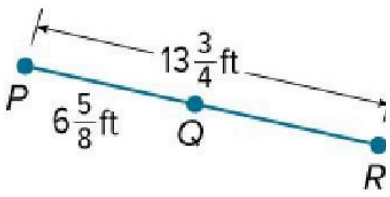
$\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}$

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

$7\frac{1}{8}$

4 | 8 | 12, 16

8, 16



Example 3

Write and Solve Equations to Find Measurements

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

4x-12

A X B 2x+3 C

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.

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

$AC = AB + BC$

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

$4(15) - 12 = 48$ ✓

$4x - 12$

x | $2x + 3$

A 15 B $2(15) + 3$ C

$+ \quad 33$

$4x-12=3x+3$
$-3x \quad -3x$
$1x-12=3$
$+12 \quad +12$
$x=15$

Step 5 Find *all the lengths to prove:*

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

Students, draw anywhere on this slide!

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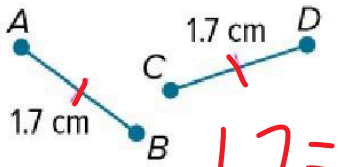
Learn
Line Segment Congruence

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.

≅ $\overline{AB} \cong \overline{CD}$



$1.7=1.7$

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Example 5
Write and Solve Equations by Using Congruence

Find the value of *x*.

$6(-2)+20$ $2(-2+6)$
$-12+20$ $2(4)$
8 8

$\overline{PQ} \cong \overline{QR}$

$6x+20=2(x+6)$
$6x+20=2x+12$
$-2x \quad -2x$
$4x+20=12$
$-20 \quad -20$

$4x = -8$

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

$x = -2$