Geometry
Unit: Introduction to Geometry
Section: Measuring Segments

Example: Midpoints of Line Segments and Distance

Screen 1

In the figure below, H is the midpoint of the given segment. Line segment AB has point H labeled in the middle. Segment AH equals 3 x plus 12 and HB equals 7 x minus 4. Find the length of segment AB. Hint: If H is the midpoint, what does that say about the values of segments AH and BH?

Step one: solve for x. Since H is the midpoint, then line segments AH and BH are equal, three x plus 12 is equal to 7x minus 4.

Add 4 to both sides of the equation and simplify. Three x plus 12 plus 4 is equal to 7 x minus 4 plus 4. 3 x plus 16 equals 7 x.

Subtract 3 x from each side, and then simplify. 3 x plus 16 minus 3 x equals 7 x minus 3 x. 16 equals 4 x.

Divided both sides of the equation by 4, then x equals 4.

Step two: Find the length of AB. If we replace x = 4 in one of the two expressions, we can calculate one-half of the segment. AH equals HB equals 3 times 4 plus 12 equals 24

Therefore, the length of the segment AB equals 2 times 24 equals 48.