

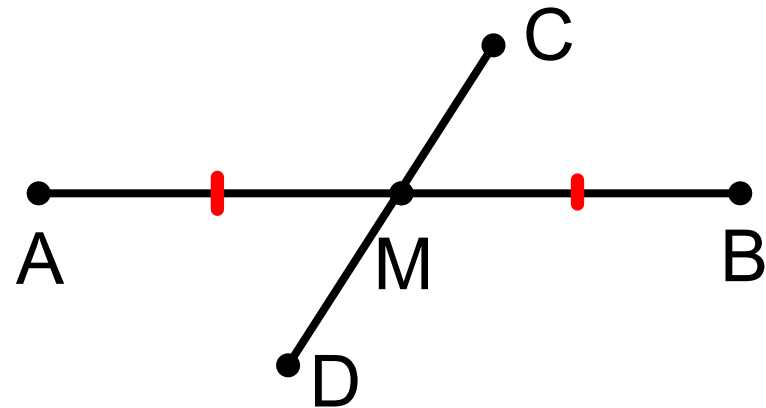
2.1 Segment Bisectors

midpoint - the point in the middle of a segment
- it divides (or **bisects**) the segment into two congruent segments

segment bisector - a segment, ray or plane that intersects a segment at its midpoint

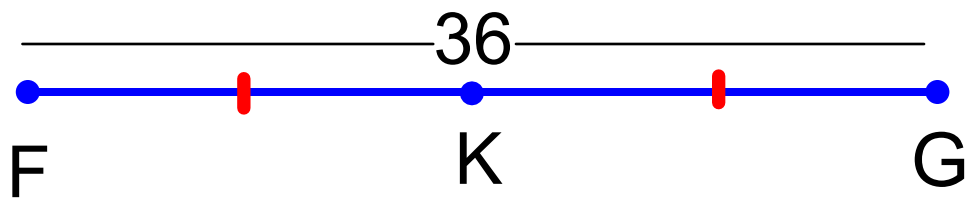


M is the midpoint of \overline{AB}
 $AM = MB$



\overline{CD} is a bisector of \overline{AB}

Example 1: K is the midpoint of \overline{FG} . Find FK and KG.



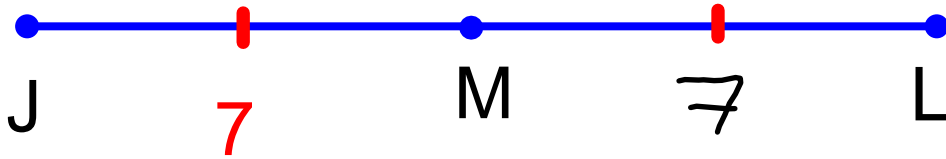
$$\frac{36 \text{ whole piece}}{2} \approx \text{pieces}$$

$$\downarrow$$
$$18$$

$$FK = 18$$

$$KG = 18$$

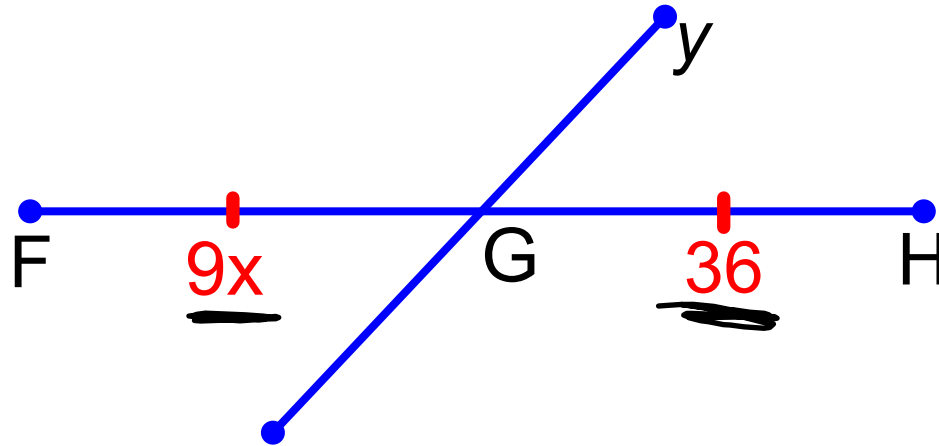
Example 2: M is the midpoint of \overline{JL} . Find ML and JL.



$$ML = 7$$

$$\overline{JL} = 7 + 7 = 14$$

Example 3: Line y is a segment bisector of \overline{FH} .
Find the value of x .



$$\frac{9x}{9} = \frac{36}{9}$$

$$x = 4$$

Midpoint Formula

To find the coordinates of the midpoint of a segment in a coordinate plane you take the average of the x-coordinates and the y-coordinates.

To find the midpoint of a segment with endpoints $A(x_1, y_1)$ and $B(x_2, y_2)$:

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

Example 4: Find the coordinates of the midpoint of \overline{AB} with the endpoints $A(-2, 3)$ and $B(5, -2)$.

$$\left(\frac{-2+5}{2}, \frac{3+(-2)}{2} \right)$$

$$\left(\frac{3}{2}, \frac{1}{2} \right)$$

or

$$(1.5, 0.5)$$

Example 5: Find the coordinates of the midpoint of \overline{DE} with the endpoints $D(3, 5)$ and $E(-4, 0)$.

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$\left(\frac{3 + (-4)}{2}, \frac{5 + 0}{2} \right)$$

$$\left(-\frac{1}{2}, \frac{5}{2} \right)$$