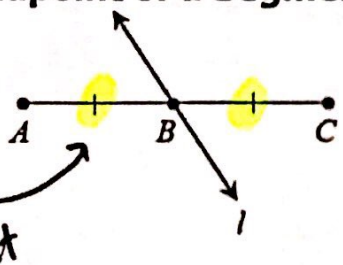
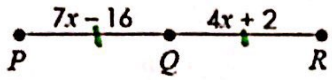
Midpoint of a Segment



marks mean congruent

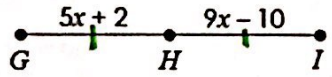
- The midpoint of a segment is a point that divides the segment into 2 equal segments.
- A line, ray or segment that intersects a segment at its midpoint is said to bisect the segment and is called the segment bisector.
- In the diagram to the left, B is the midpoint of $\overline{AC}$ and line l is a segment bisector of $\overline{AC}$.

8. If Q is the midpoint of $\overline{PR}$, find the value of x.



$7x - 16 = 4x + 2$
$-4x \quad -4x$
$3x - 16 = 2$
$+16 \quad +16$
$3x = 18$ $\boxed{x = 6}$

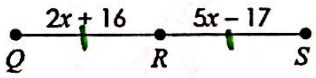
9. If H is the midpoint of $\overline{GI}$, find GH.



$5x + 2 = 9x - 10$
$-5x \quad -5x$
$2 = 4x - 10$
$+10 \quad +10$
$12 = 4x$ $x = 3$

$GH = 5(3) + 2$
$= 15 + 2$
$\boxed{= 17}$

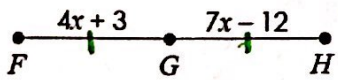
10. If R is the midpoint of $\overline{QS}$, find QS.



$2x + 16 = 5x - 17$
$-2x \quad -2x$
$16 = 3x - 17$
$+17 \quad +17$
$33 = 3x$ $x = 11$

$QS = QR + RS \rightarrow 38 + 38$ $\boxed{= 76}$
$QR = 2(11) + 16$
$22 + 16$
38
$QS = 5(11) - 17$
$55 - 17$
38

11. If G is the midpoint of $\overline{FH}$, find the value of x.



$4x + 3 = 7x - 12$
$-4x \quad -4x$
$3 = 3x - 12$
$+12 \quad +12$
$15 = 3x$ $\boxed{x = 5}$