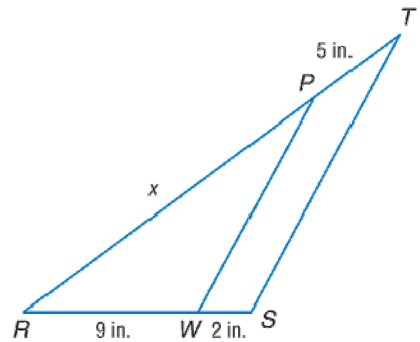
Lesson 7-6

Example 1

Given $\triangle RST$, $\overline{PW}$ ॐ $\overline{ST}$.
Find the measure of x.



Solution

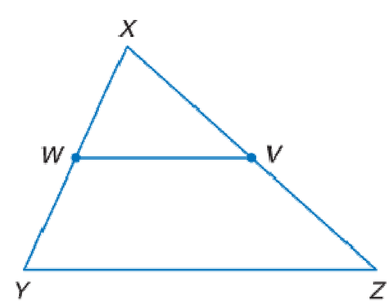
According to the theorem listed in Lesson 7-6 of your text, because $\overline{PW}$ ॐ $\overline{ST}$, P divides $\overline{RT}$ proportionally and W divides $\overline{RS}$ proportionally.

$$\frac{TP}{PR} = \frac{SW}{WR}$$
$$\frac{5}{x} = \frac{2}{9}$$
$$x = 22.5$$

So the measure of x is 22.5 in.

Example 2

MODEL BUILDING Lesa is building a miniature stage model for an upcoming performance. She draws a diagram of a triangular stage. A catwalk, represented by $\overline{WV}$ on the diagram shown at the right seems to be parallel to the base of the stage. Lesa measures to determine that W is the midpoint of $\overline{XY}$ and V is the midpoint of $\overline{XZ}$. How can she prove that $\overline{WV}$ is parallel to $\overline{YZ}$?

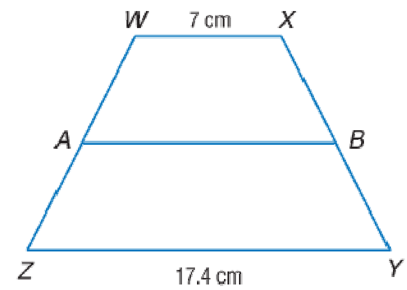


Solution

You can prove that $\triangle XYZ \sim \triangle XWV$ by the SAS Similarity Postulate. Therefore, $\angle XWV \cong \angle XYZ$ because they are corresponding angles of similar triangles. This fact also leads to the conclusion that $\overline{WV}$ ॐ $\overline{YZ}$, because corresponding angles formed by a transversal ($\overline{XY}$) are congruent.

Example 3

Given Trapezoid *WXYZ*, median $\overline{AB}$. Find *AB*.



Solution

The length of the median is half the length of the sum of the bases.

$$AB = \frac{WX + YZ}{2}$$

$$AB = \frac{7 + 17.4}{2}$$

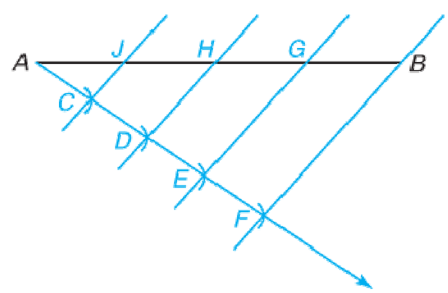
$$AB = \frac{24.4}{2} = 12.2$$

The length of the median is 12.2 cm.

Example 4

Divide $\overline{AB}$ into 4 congruent parts.

Solution



Step 1: Draw a ray with *A* as an endpoint.

Step 2: Use a compass to mark off on the ray any shorter length *AC*. At *C*, mark off $\overline{CD} \cong \overline{AC}$. At *D*, mark off $\overline{DE} \cong \overline{AC}$, at *E*, mark off $\overline{EF} \cong \overline{AC}$.

Step 3: Draw $\overline{BF}$.

Step 4: At *E*, construct $\overline{EG}$ ॐ $\overline{BF}$. At *D*, construct $\overline{DH}$ ॐ $\overline{BF}$. At *C*, construct $\overline{CJ}$ ॐ $\overline{BF}$.

Because $\triangle ACJ \sim \triangle ADH \sim \triangle AEG \sim \triangle AFB$ and $AC = CD = DE = EF$, then $AJ = JH = HG = GB$.