## TOPIC 1-6: SEGMENTS, MIDPOINTS, AND BISECTORS

EXAMPLE 1 Find PQ, QR and PR on the number line shown below.


Examine the measures of PQ, QR and PR in EXAMPLE 2. Notice that $1.5+4.5=6$, so $\qquad$ . This suggests the following postulate...
Segment Addition Postulate: If $Q$ is between $P$ and $R$, then
$P Q+Q R=P R$. If $P Q+Q R=P R$, then $Q$ is between $P$ and $R$.
Part + Part $=$ Whole

EXAMPLE 2 If $B$ is between $A$ and $C$ and $A B=4$ and $B C=5$, then $A C=$ $\qquad$
$\overline{E X A M P L E} \overline{3} \overline{\text { If }} \bar{A} \bar{B}=\bar{x}, \bar{B} \bar{C}=\bar{x}+\overline{6} \overline{\text { and }} \bar{A} \bar{C}=\overline{2} 4$, then find $\bar{A} \bar{B} \overline{\text { and }}$ $B C$.
$A B=$ $\qquad$ ; $\mathrm{BC}=$ $\qquad$

EXAMPLE 4 Find $L M$ if $L$ is between $N$ and $M, N L=6 x-5$, $L M=2 x+3$ and $N M=3 x+13$.

LM = $\qquad$

| TERM | DEFINITION | SKETCH |
| :--- | :--- | :--- |
| Midpoint | A point on a segment equidistant <br> from both endpoints. |  |

EXAMPLE 1 B is the midpoint of $\overline{\mathrm{AC}} . \mathrm{AB}=\mathrm{z+2}$ and $\mathrm{BC}=2 \mathrm{z} \mathbf{- 6}$. Find " $z$ ".

| TERM | DEFINITION | SKETCH |
| :--- | :--- | :--- |
| Segment <br> Bisector | A point, line, ray, segment, or <br> plane that intersects a segment <br> at its midpoint |  |

Use the figure below to answer EXAMPLES 3-5.


EXAMPLE 2 If $\mathrm{UY}=5$, then find YV and UV .

EXAMPLE 3 If $U Y=4 x-3$ and $Y V=x$, find $U Y$ and $U V$.

EXAMPLE 4 If $U V=18$ and $U Y=9$, find $Y V$.

EXAMPLE $5 \overline{\mathrm{AB}}$ bisects $\overline{\mathrm{EF}}$ at T . If $\mathrm{EF}=\mathrm{x}+\mathbf{6}$ and $\mathrm{TF}=\mathrm{x}-1$, find TE.

EXAMPLE $6 B$ is between $A$ and $C . A B=2 y+6, B C=y+8$, and $A C=20$. Find the value of " $y$ " and determine if $B$ is a bisector.

