5-1 Solve It!

Getting Ready!

You know about midpoints, and you know about segments. This problem combines the two.
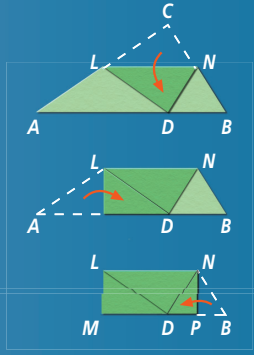
Cut out a triangle of any shape. Label its largest angle C, and the other angles A and B. Fold A onto C to find the midpoint of $\overline{AC}$. Do the same for $\overline{BC}$. Label the midpoints L and N, and then draw $\overline{LN}$.

Fold the triangle on $\overline{LN}$ as shown. Fold A to D and fold B to D.

Label the vertices M and P as shown. What is the relationship between MP and AB? How do you know? What conjecture can you make about the relationship between LN and AB?

5-1 Lesson Quiz

Use the triangle at the right for Questions 1–3.

1. What are the three pairs of parallel segments in $\triangle ABC$?

2. If the length of $\overline{XZ}$ is known, what other segment can you assign a length?

3. If it is given that $AX = 3.5$, what is the length of YZ?

4. **Do you UNDERSTAND?** In $\triangle MON$, J, K, and L are midpoints. If $JL = 11$, $LK = 13$, and $ON = 20$, and $JL \parallel MN$, $LK \parallel MO$, and $JK \parallel ON$, what is the length of MN, MO, and JK?
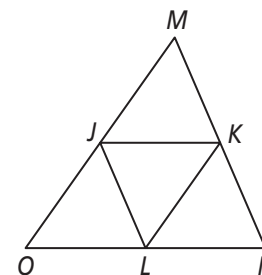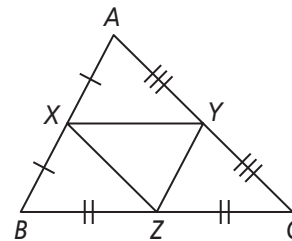
Answers

Solve It!

$MP = \frac{1}{2}AB$; answers may vary. Sample:
From the folding process you know that
$AM = MD$ and $DP = PB$.

$AB = AM + MD + DP + PB$, so $AB = MD + MD + DP + DP$ or $AB = 2(MD + DP) = 2MP$.
Then $\frac{1}{2}AB = \frac{1}{2}(2MP) = MP$.
Conjecture: LN is the same length as MP, so $LN = \frac{1}{2}AB$.

Lesson Quiz

1. $\overline{AB} \parallel \overline{YZ}$, $\overline{BC} \parallel \overline{XY}$, $\overline{AC} \parallel \overline{XZ}$
2. $\overline{AC}$
3. 3.5
4. $MN = 22$, $MO = 26$, $JK = 10$