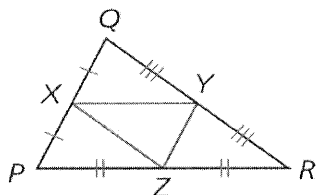


I. What is a midsegment?

A midsegment of a triangle is a segment that joins the midpoints of two sides of the triangle. Every triangle has three midsegments, which form the midsegment triangle.



Midsegments: \overline{XY} , \overline{YZ} , \overline{ZX}
 Midsegment triangle: $\triangle XYZ$

Example #1: The vertices of $\triangle XYZ$ are $X(-1, 8)$, $Y(9, 2)$, and $Z(3, -4)$. M and N are the midpoints of \overline{XZ} and \overline{YZ} . Show that $\overline{MN} \parallel \overline{XY}$ and $MN = \frac{1}{2}XY$.

* use graph paper!

↓
 show
 slopes are
 the
 same!

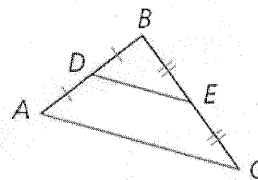
↘ use the distance formula!

II. What is the Triangle Midsegment Theorem?

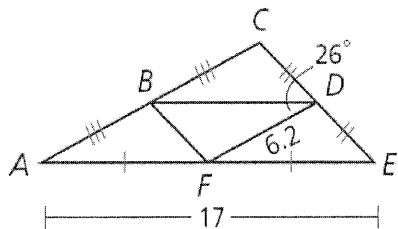
Theorem 5-4-1 Triangle Midsegment Theorem

A midsegment of a triangle is parallel to a side of the triangle, and its length is half the length of that side.

$$\overline{DE} \parallel \overline{AC}, DE = \frac{1}{2}AC$$



Example #2: Find each measure.

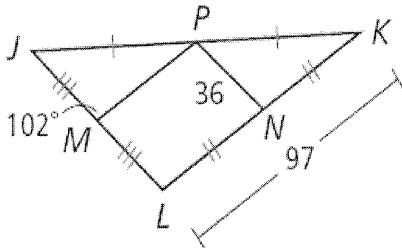


a. $BD = \frac{1}{2}(AE) = \frac{1}{2}(17) = 8.5$

b. $m\angle CBD = 26^\circ$

c. $CA = 12.4$
 (B/C $AC \parallel DF$!)

Example #3: Find each measure.



a. $JL = 72$

b. $m\angle MLK = 102^\circ$

c. $MP = 48.5$

d. $m\angle PML = 78^\circ$
(Lin. pair)

e. $m\angle MPN = 102^\circ$
(Alt. int. \angle s $\rightarrow JL \parallel PN$)

f. $m\angle KNP = 102^\circ$
(Corres. \angle s)

Example #4: In an A-frame support, the distance \overline{PQ} is 46 inches.

What is the length of the support \overline{ST} if S and T are at the midpoints of the sides?

