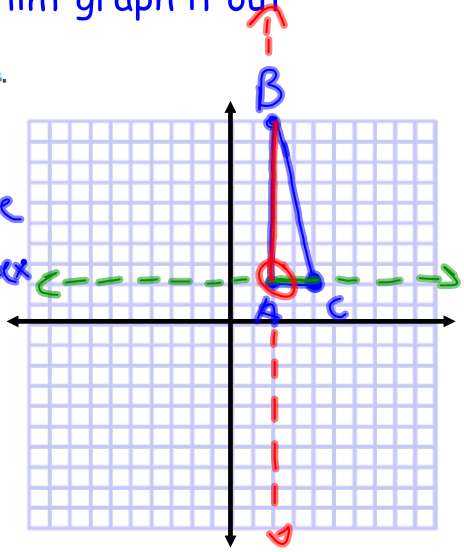
Bell Work: **Hint graph it out**

Find the orthocenter of each triangle with the given vertices.

$A(2, 2)$, $B(2, 10)$, $C(4, 2)$ Altitudes

90° to opposite side from Vertex

O.C.=(2,2)



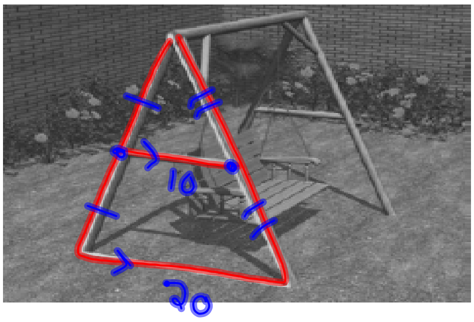
* If right triangle, orthocenter is ordered pair where right angle is formed. *

8.4 Midsegments of Triangles

Essential Question: How are the segments that join thee midpoints of a triangle's sides related to the triangle's sides?

Midsegment- a line segment that connects the midpoints of 2 sides of the triangle (parallel to the 3rd side and is 1/2 as long as the 3rd side)

In the support for the garden swing shown, the crossbar is the midsegment



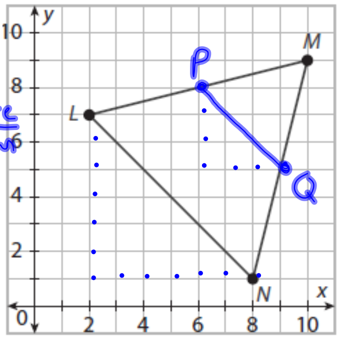
Example 1 Show that the given midsegment of the triangle is parallel to the third side of the triangle and is half as long as the third side.

The vertices of $\triangle LMN$ are $L(2, 7)$, $M(10, 9)$, and $N(8, 1)$. P is the midpoint of $\overline{LM}$, and Q is the midpoint of $\overline{MN}$.

Show that $\overline{PQ} \parallel \overline{LN}$ and $PQ = \frac{1}{2}LN$. Sketch $\overline{PQ}$.

Same Slope Distance

This is on page 397



Slopes = $\frac{\text{Rise}}{\text{Run}}$

$PQ = \frac{-3}{3} = -1$

$LN = \frac{-6}{6} = -1$

$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$P = \left(\frac{2+10}{2}, \frac{7+9}{2}\right) = (6, 8)$

$Q = \left(\frac{10+8}{2}, \frac{9+1}{2}\right) = (9, 5)$

$d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$

$PQ = \sqrt{(9-6)^2 + (5-8)^2}$

$PQ = \sqrt{(3)^2 + (-3)^2} = \sqrt{18}$

$LN = \sqrt{(8-2)^2 + (1-7)^2}$

$LN = \sqrt{(6)^2 + (-6)^2} = \sqrt{72}$

$L = (2, 7)$

$N = (8, 1)$

$PQ = \sqrt{18}$

$1 \cdot 18$

$9 \cdot 2$

$PQ = \sqrt{9} \cdot \sqrt{2}$

$PQ = 3\sqrt{2}$

$LN = \sqrt{72}$

$\cancel{1 \cdot 72}$

$\cancel{4 \cdot 18}$

$9 \cdot 8$

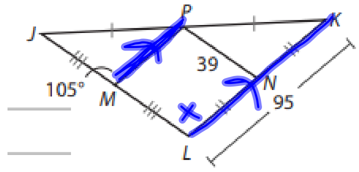
$36 \cdot 2$

$LN = \sqrt{36} \cdot \sqrt{2}$

$LN = 6\sqrt{2}$

pg. 398

JL, PM, ∠MLK



$JL = 39 \cdot 2 = 78$

$PM = 95 \div 2 = 47.5$

$\angle MLK = 105°$

pg. 400 #6-10