

Midsegment Theorem

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Midsegment of a Triangle

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 - perpendicular bisectors, angle bisectors, medians, and altitudes.

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- Another special type of segment is called a *midsegment*.

Midsegment of a Triangle

- Earlier, we studied four special types of segments of a triangle:
 - perpendicular bisectors, angle bisectors, medians, and altitudes.
- A midsegment of a triangle is a segment that connects the midpoints of two sides of a triangle.

Midsegment of a Triangle

- You can form the three midsegments of a triangle by tracing the triangle on paper, cutting it out, and folding it, as shown below.

- Fold one vertex onto another to find one midpoint.
- Repeat the process to find the other two midpoints.
- Fold a segment that contains two of the midpoints.
- Fold the remaining two midsegments of the triangle.

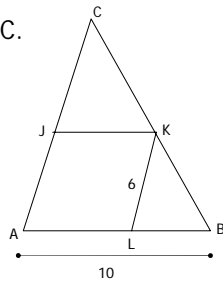
Midsegment Theorem

- THEOREM 5.9 *Midsegment Theorem***
 - The segment connecting the midpoints of two sides of a triangle is parallel to the third side and is half as long.

$DE \parallel AB$ and $DE = \frac{1}{2} AB$

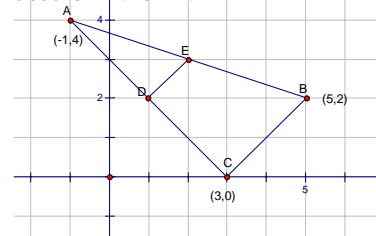
Using the Midsegment Theorem

- JK and KL are midsegments of $\triangle ABC$. Find JK and AB.



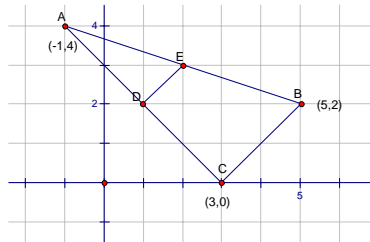
Using the Midsegment Theorem

- \overline{DE} is a midsegment of $\triangle ABC$. What are the coordinates of D? of E?



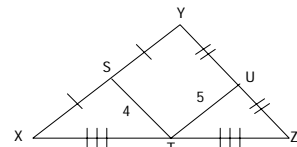
Using the Midsegment Theorem

- Are \overline{DE} and \overline{CB} parallel?



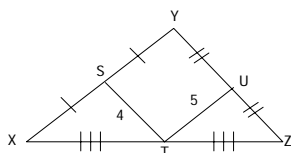
Using the Midsegment Theorem

- In $\triangle XYZ$, which segment is parallel to \overline{XY} ?



Using the Midsegment Theorem

- If $\overline{ST} \parallel \overline{YZ}$, what is YZ?

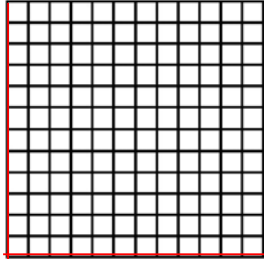


Using the Midsegment Theorem

- The midpoints of the sides of a triangle are S (1,5), T (3,3), and V (4,6). What are the coordinates of the vertices of the triangle?

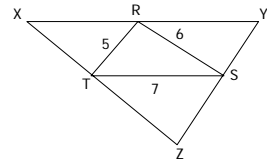
Using the Midsegment Theorem

- Midpoints: S (1,5), T (3,3), and V (4,6).



Using the Midsegment Theorem

- The perimeter of the triangle formed by the three midsegments of a triangle is *half* the perimeter of the original triangle.



Using the Midsegment Theorem

- \overline{RT} , \overline{RS} and \overline{ST} are midsegments of $\triangle XYZ$. Find the perimeter of $\triangle XYZ$.

