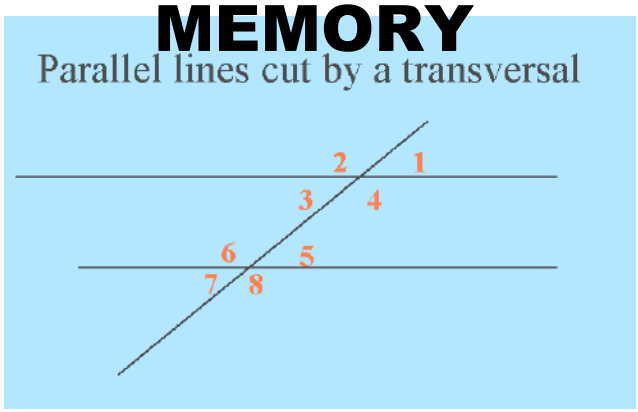
Name: _____ **Date:** _____

Geometry A U4D5 Midsegments

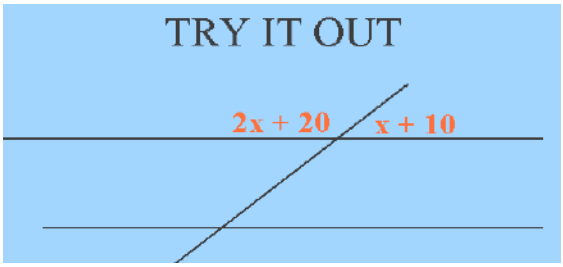
J0G YOUR MEMORY

Warm Up Name a Pair of:

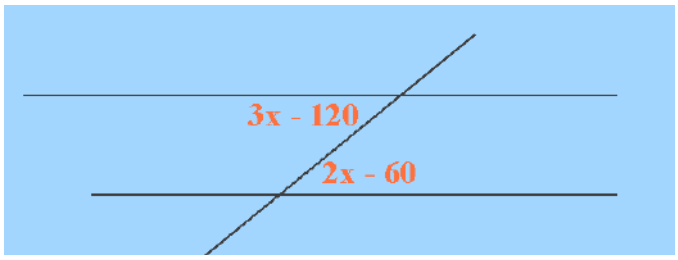
- VERTICAL ANGLES
- CORRESPONDING ANGLES
- ALTERNATE INTERIOR ANGLES
- ALTERNATE EXTERIOR ANGLES
- SAME SIDE INTERIOR ANGLES



1) Solve for x.

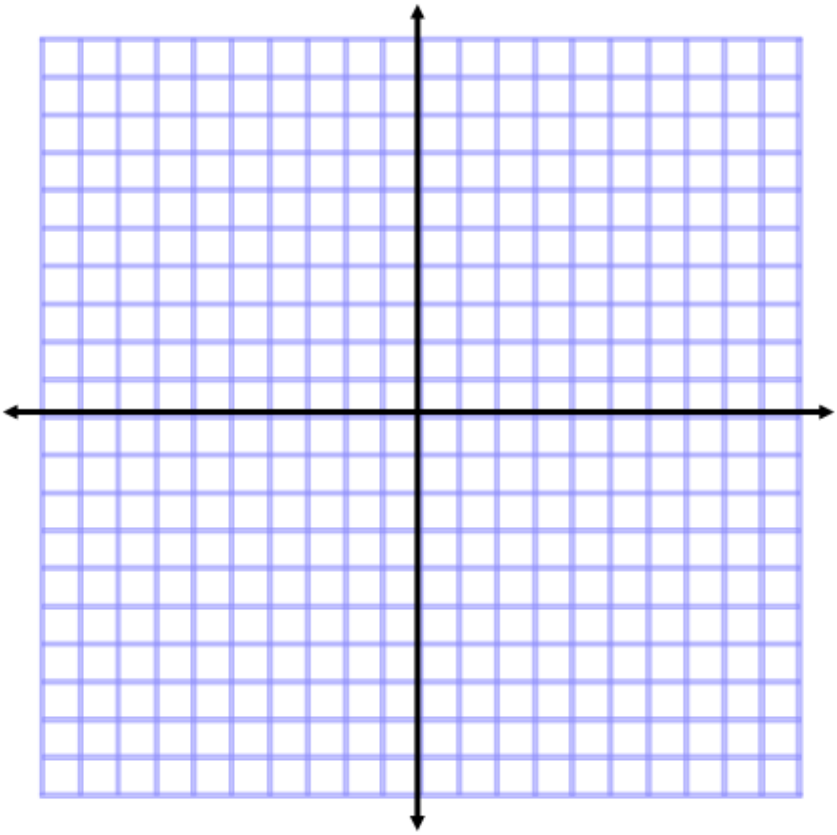


2) Solve for x.



Investigate the mid-segments of a triangle

Plot the following points to create a triangle: A(0, 2); B(- 8, 2) and C (-8, 8)



1. Find the midpoints of all 3 sides of the triangle. Label them D, E and F.
2. Connect these 3 midpoints to form the 3 mid-segments. D is the midpoint of BC
   E is the midpoint of AC & F is the midpoint of AB
3. Find all the side lengths of the triangle: AB=_____ BC=____ AC=____

4. Find the mid-segment lengths and label them. DE=____ EF=____ DF=___

What do you notice about the lengths of the mid-segments compared to the opposite sides of the triangle?

5. Find the slope of all 3 mid-segments:

slope AB=_____ slope BC=_____ slope AC=_____

slope DE=_____ slope EF=_____ slope DF=_____

What do you notice about the slopes of the mid-segments compared to the slopes of the opposite sides of the triangle? What can you conclude?

Outside High School

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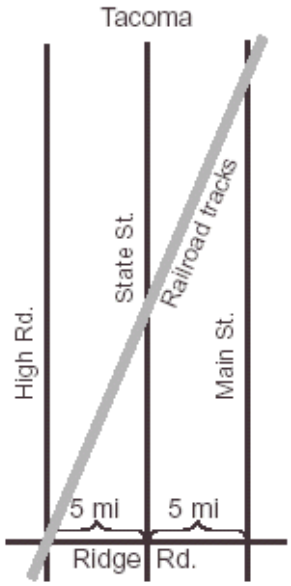
Geometry A U4D5 Midsegments Notes

Example 1: Another way of exploring midsegments. The accompanying diagram shows a section of the city of Tacoma. High Road, State Street, & Main Street are parallel and 5 miles apart. Ridge Road is perpendicular to the three parallel streets. The distance between the intersection of Ridge Road and State Street and where the railroad tracks cross State Street is 12 miles.



a. Find the distance from the intersection of Ridge Road and Main Street to Main Street's intersection with the railroad tracks.

b. Find the length of railroad tracks from Ridge Road to Main Street.

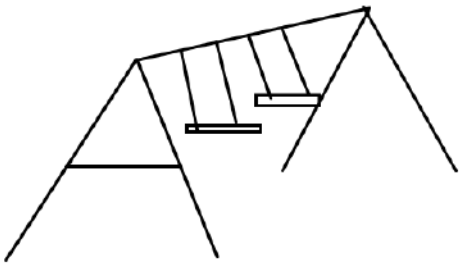
c. What 3 facts indicate that State Street acts as the midsegment of the triangle formed?

_____

_____

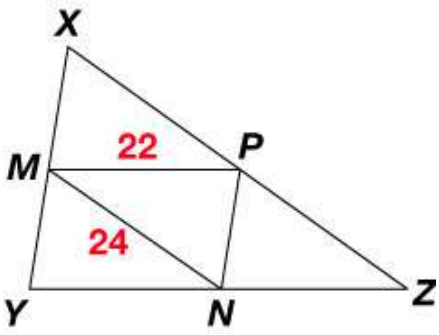
_____

Example 2: Mr. Paley is setting up a swing set for his children. For stability, he buried the legs of the A-frame in concrete. The cross bars will support the structure at the **halfway point** in the angle. The cross bars are 36 inches long. How far apart are the bottom of the A frames?



Example 3:

1) In triangle *XYZ*, *M*, *N*, and *P* are midpoints. **The perimeter of triangle *MNP* is 60.**

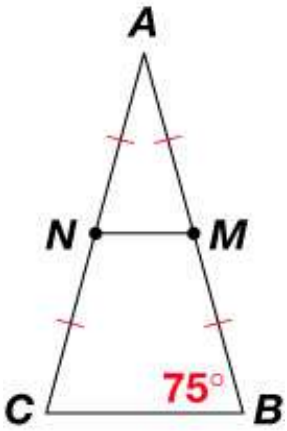


Find NP

Find YZ

Example 4: N and M are midpoints of AC and AB in triangle ABC.

Use parallel lines cut by a transversal!!!



Find $\angle AMN$

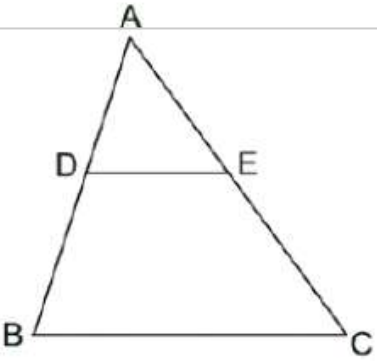
Find $\angle ANM$

Find $\angle A$

5) Blast from the Past: The widths of two similar prisms are 8 cm and 18 cm.
What is the ratio of the perimeters? Of the areas? of the Volumes?

6) In $\triangle ABC$ at the right, $\overline{DE} \parallel \overline{BC}$, $AD=3$, $DE=4$ and $DB=6$.

a) Find BC.



b) Give two explanations of why DE can NOT be a midsegment.

_____

_____

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Geometry A U4D5 Midsegments HW

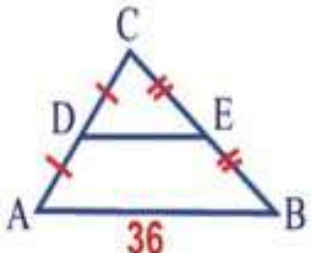
1) If 2 similar trapezoids have a scale factor of 3:2 for their corresponding sides, ...

   a) the ratio of the corresponding perimeters is_____.

   b) the ratio of the corresponding areas is_____.

2) If the ratio of corresponding heights of 2 similar cones is 5:3, then what is the ratio of their volumes?

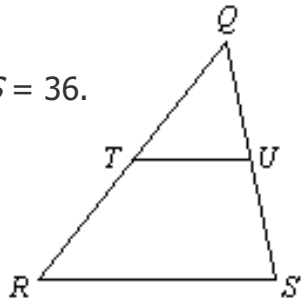
3) Find DE.



4) T is the midpoint of $\overline{QR}$. U is the midpoint of $\overline{QS}$. $m\angle QUT = 85$ and $RS = 36$.

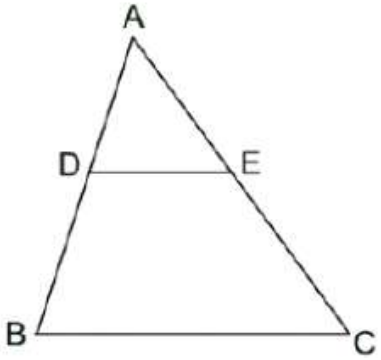
a. Find $m\angle QSR$.

b. Find TU.



5) In $\triangle ABC$ at the right, $\overline{DE} \parallel \overline{BC}$, $m\angle A = 55°$, and $m\angle C = 60°$. Find the $m\angle ADE$.

What theorem are you using?

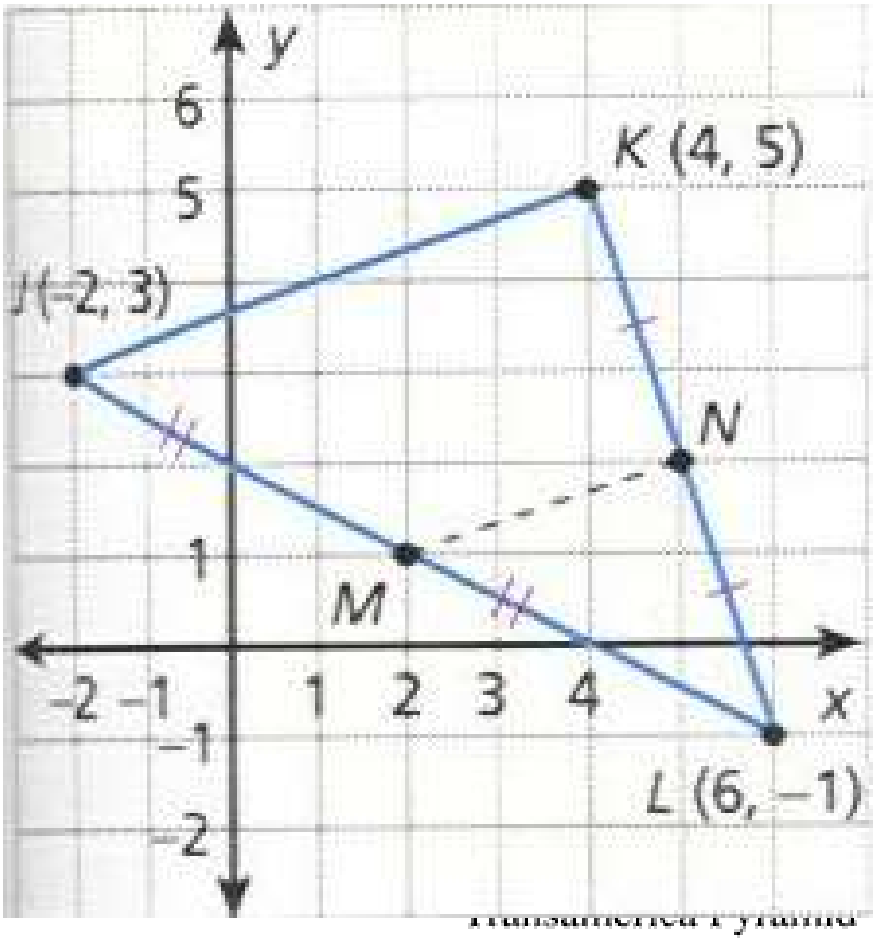


6) Corresponding sides of two similar triangles are 6 and 15. If the perimeter of the smaller triangle is 22, what is the perimeter of the *larger* triangle?

Illustrating the mid-segment theorem:

Graph: J(-2, 3) K(4, 5) L(6, -1)

Show that the mid-segment MN is parallel to the side JK and half its length.



7) Find the midpoints:

M=

N=

8) Find the slopes:

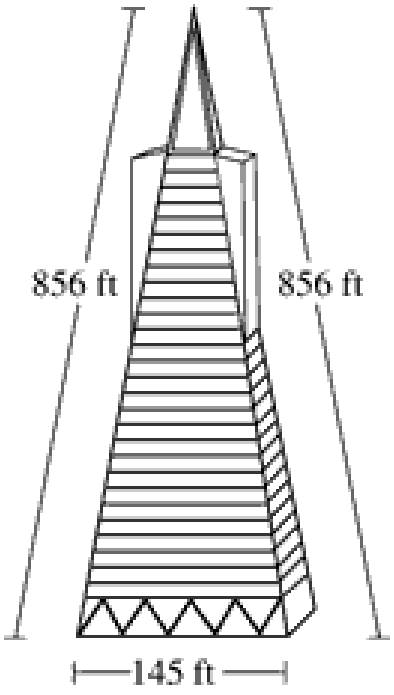
MN=

JK =

9) Find the lengths:

MN=

JK=



10) The base of the Transamerica Building in San Francisco, CA, is 145 feet. If the distance from a base corner of the building to its peak is 856 feet, how wide is it halfway to the top?

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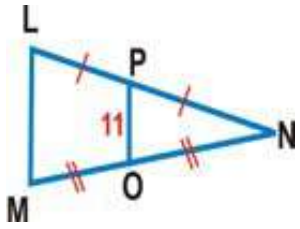
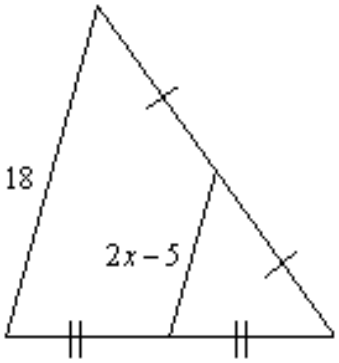
Geometry A U4D5 Midsegments GROUP QUIZ

1) Find LM explain why



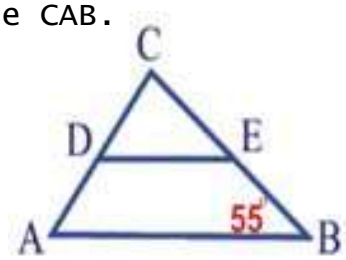
2) Find the value of x.



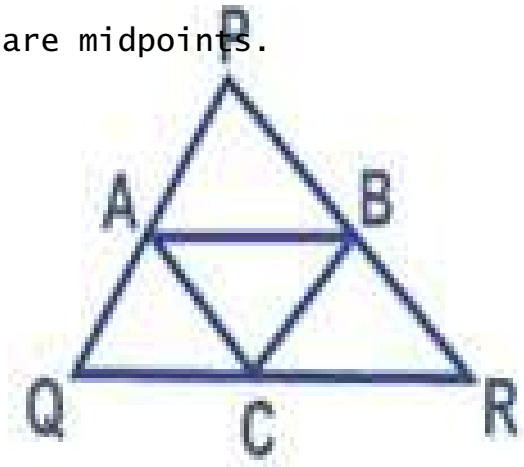
3) DE is a mid-segment of triangle CAB.

Find the measure of angle CED.

Find the measure of angle BED.



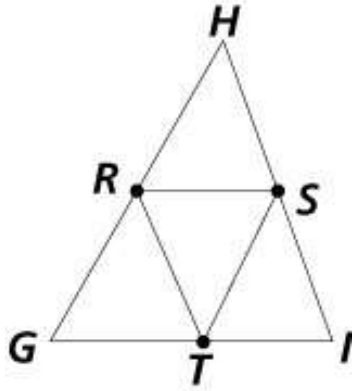
4) **Given AC = 6, CB =5, AB = 9.** A, B & C are midpoints.
Find the perimeter of ΔPQR.

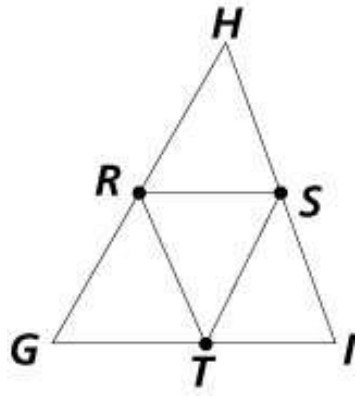


5) In triangle *GHI*, *R*, *S*, and *T* are midpoints. Show work by labeling diagrams.

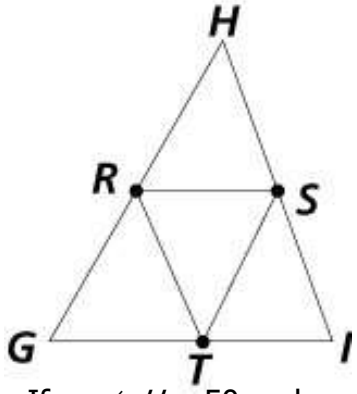
A. If *GH* = 20 and *HI* = 18, find *RT*.

B. If *RH* = 7 and *RS* = 5, find *ST*.

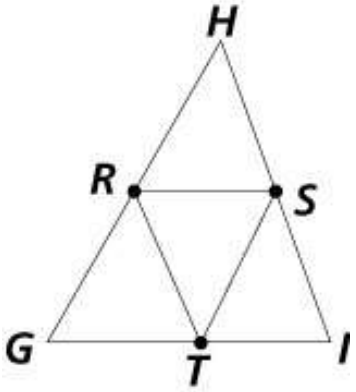




C. If $m \angle G = 60$ and $m \angle I = 70$, find $m \angle GTR$.



D. If $m \angle H = 50$ and $m \angle I = 66$, find $m \angle ITS$.



E. If $m \angle G = m \angle H = m \angle I$ and $RT = 15$, find the perimeter of $\triangle GHI$.