

U7D4_T midpoints medians (short)

Friday, May 4, 2018 12:41 PM



U7D4short
_T midpoi...

MIDPOINTS AND MEDIANS IN TRIANGLES

TERMINOLOGY

Test Change? (File Drill)

Midpoint: A point that divides a line segment into two equal segments.

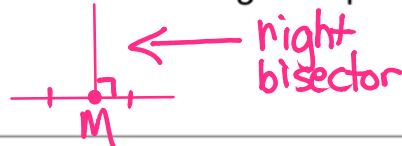


Median: the line segment joining a vertex of a triangle to the midpoint of the opposite side.



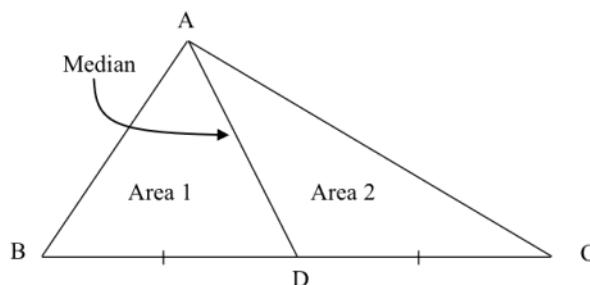
Bisect: Divide into two equal parts

Right Bisector: A line perpendicular to a line segment passing through its midpoint.



Key Concepts:

1. The median of a triangle bisects its area.



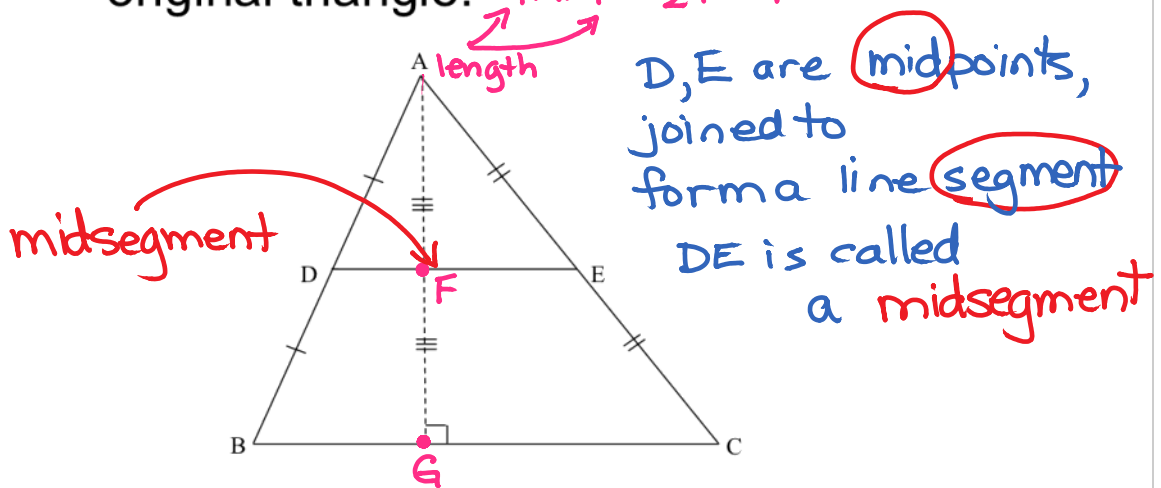
$$\begin{aligned} \text{Area 1} &= \text{Area } \frac{2}{2} \\ \text{Area 1} &= \frac{1}{2} \text{ Area ABC} \\ \text{Area 2} &= \frac{1}{2} \text{ Area ABC} \end{aligned}$$

A Midsegment

2. A line segment joining the midpoints of two sides of a triangle is

parallel to the third side and is half as long $DE \parallel BC$
 $|DE| = \frac{1}{2} |BC|$

3. The height of a triangle formed by joining the midpoints of two sides of a triangle is half the height of the original triangle. $|AF| = \frac{1}{2} |AG|$



4. The area of the triangle formed by joining the midpoints of two sides of a triangle is one quarter the area of the original triangle.

Example: $|BC| = 8$, $|AG| = 12$ Calculate $|\Delta ABC|$, $|\Delta ADE|$

$A = \frac{bh}{2}$, $|\Delta ABC| = \frac{8(12)}{2} = 48u^2$

$|DE| = \frac{1}{2} |BC| = 4$, $|AF| = 6$

$|\Delta ADE| = \frac{4(6)}{2} = 12u^2$

** NOTE: Your homework may ask you to prove something is not true by showing a COUNTER – EXAMPLE. This just means draw an example where you show what they are saying is not true.

EXAMPLES:

1. Solve for:

a) angle FAE (provide reasoning)

$\angle CED = 30^\circ$ (ASTT)

$\angle CED = \angle AEF$ (OAT)

FE is a midsegment

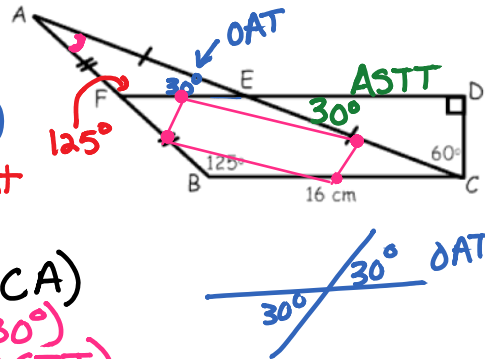
so $FE \parallel BC$.

$\angle AFE = 125^\circ$ (TPT - CA)

$\angle FAE = 180^\circ - (125^\circ + 30^\circ)$
 $\angle FAE = 25^\circ$ (ASTT)

$|EF| = \frac{1}{2} |BC|$ (midsegment)

$|EF| = 8 \text{ cm}$



c) What type of quadrilateral is formed from joining the midpoints of quadrilateral BCEF?

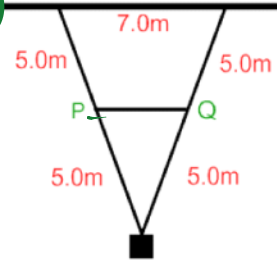
Parallelogram

2. Construct a triangle with vertices A, B, and C, with $AB = AC$. Let D be the midpoint of BC. Will the right bisector through D pass through the vertex A? Why or why not?

Nothing this tough on your test
but know how to draw a right bisector.

3. Calculate the length of the cross-brace PQ in this bridge support.

$$|PQ| = \frac{1}{2}(7) \text{ (midsegment)}$$
$$= \boxed{3.5 \text{ m}}$$



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