Creata
ADDING CREATIVITY TO LEARNING

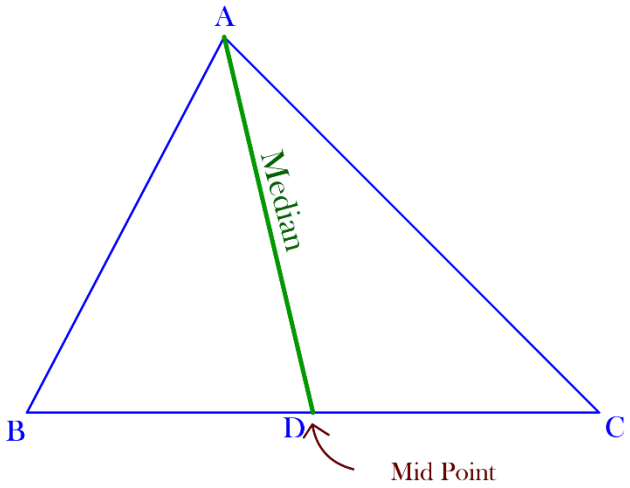
Visit us at www.CreataClasses.com

Contact us: Admin@CreataClasses.com

"SEGMENTS OF TRIANGLE & TRIANGLE CENTERS"

MEDIANS

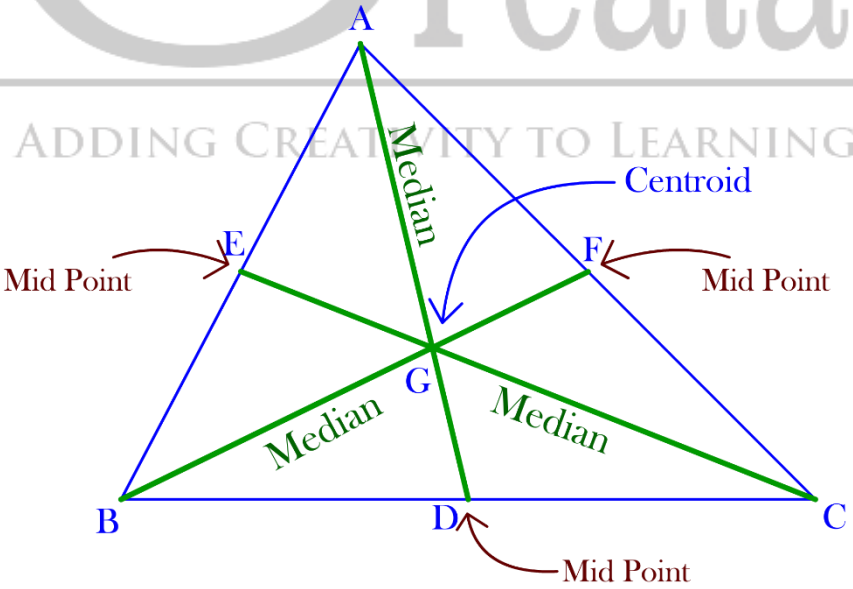
A median of a triangle is a line segment joining a vertex to the midpoint of the opposite side, i.e., bisecting the opposite side.



In the ΔABC, AD is the median. M is the mid point of side BC.

Every triangle has exactly three medians, one from each vertex.

Medians of triangle intersect at a common point known as Centroid. Centroid is generally denoted as G.



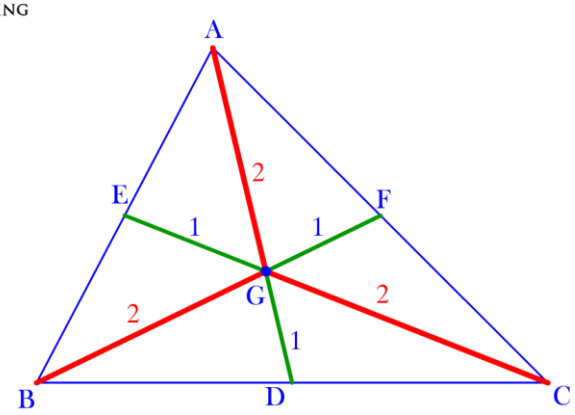
CREATA CLASSES
Admin@CreataClasses.com

Centroid divides the medians into ratio of 2:1

AG : GD = 2 : 1

BG : GF = 2 : 1

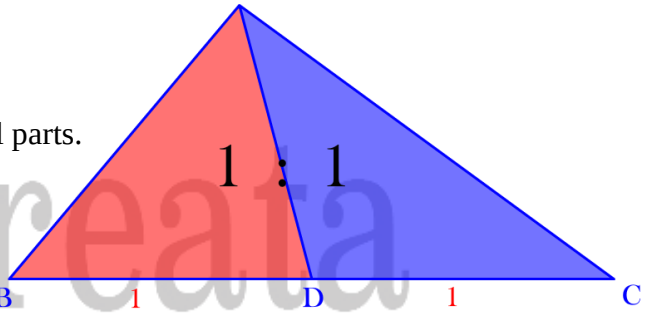
CG : GE = 2 : 1

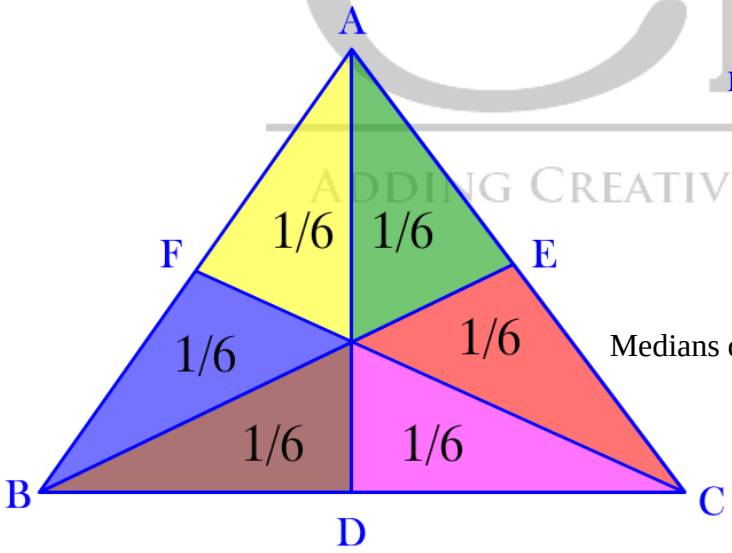


$$\frac{BG}{GF} = \frac{2}{1} \qquad \frac{AG}{GD} = \frac{2}{1} \qquad \frac{CG}{GE} = \frac{2}{1}$$

Note: Segment with vertex (AG, BG & CG) will be larger.

Median divides the area of triangle into 2 equal parts.



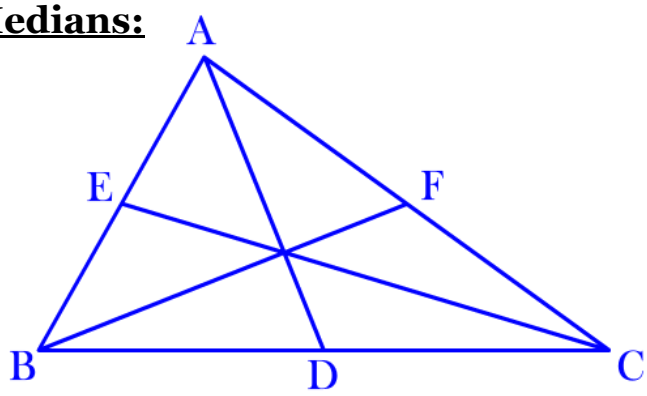


Medians divides the complete triangle into 6 equal parts.

$$\text{Area of Triangle} = \frac{4}{3}\,(\text{Area of Triangle fromed by Medians})$$

CREATA CLASSES
Admin@CreataClasses.com

Relation between Sides of Triangle & Medians:



1. $AB + AC > 2AD$
   $AC + BC > 2CE$
   $AB + BC > 2BF$

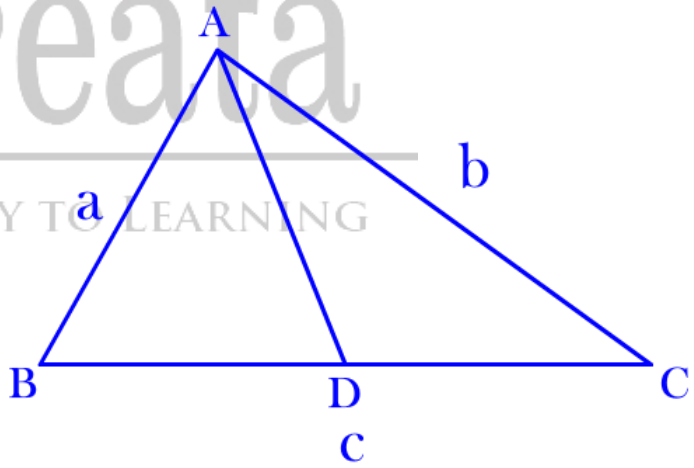
2. $AB + BC + AC > AD + BF + CE$
   Sum of Sides of Triangle > Sum of Medians of the Triangle

3. $4\,(AD + BE + CF) > 3\,(AB + BC + AC)$
   4 (Sum of Medians of Triangle) > 3 (Sum of Sides of Triangle)

4. $3\,(AB + BC + AC) > 2\,(CF + AD + BE)$
   3 (Sum of Sides of Triangle) > 2 (Sum of Medians of Triangle)

5. **Apollonius Theorem**

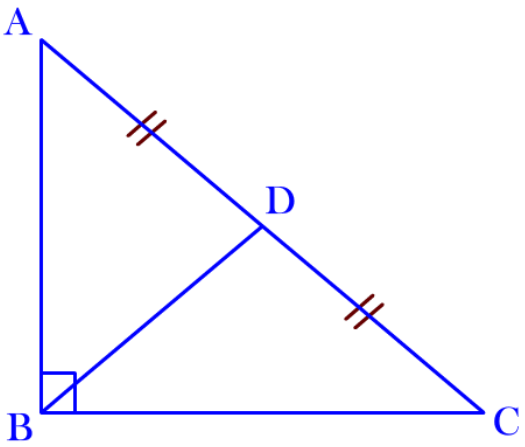
$$a^2 + b^2 = 2\left[AD^2 + \left(\frac{c}{2}\right)^2\right]$$



6. $4\,(AD^2 + BD^2 + CF^2) = 3(a^2 + b^2 + c^2)$
   4 (Sum of Square of Medians) = 3(Sum of Square of Sides of Triangle)

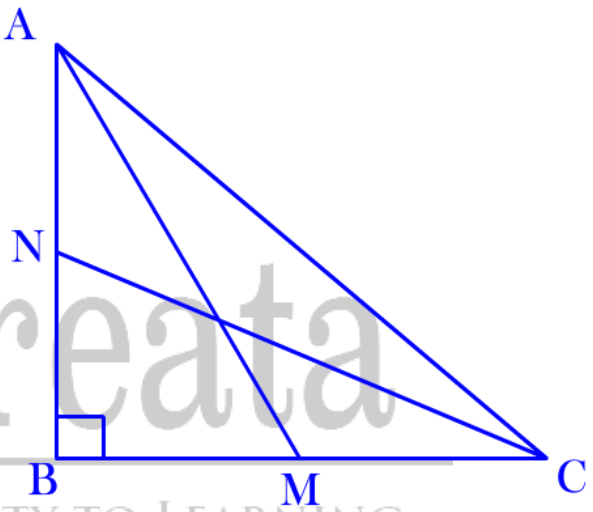
CREATA CLASSES
Admin@CreataClasses.com

Medians in Right-Angled Triangle



1. $$BD = \frac{1}{2} AC = CD = AD$$

In a Right angled triangle, Median to Hypotense is equal to half of the Hypotenuse.



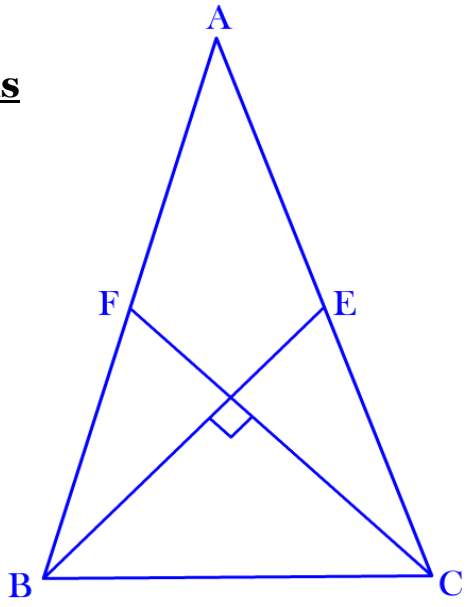
2. $$\frac{5}{4} AC^2 = AM^2 + CN^2$$

Note: Above 2 cases are applicable only and only inside a right angled triangle. Don't be confused it with other type of triangles.

Triangle with 2 Perpendicular Medians

$$AB^2 + AC^2 = 5\,BC^2$$

Median BE & CF are perpendicular to each other.



CREATA CLASSES
Admin@CreataClasses.com

NOTES:

CREATA CLASSES
Admin@CreataClasses.com