Centroid of a Triangle

Objective
To find the centroid of a triangle using paper cutting and foldinf activity

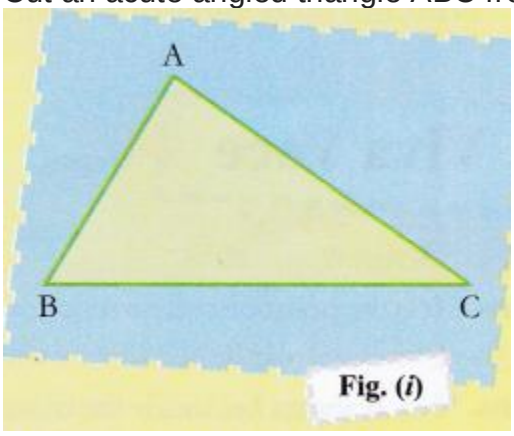
Prerequisite Knowledge

1. Concept of finding the mid-point of a line segment by paper folding.
2. Definition of medians.
3. Meaning of Centroid.

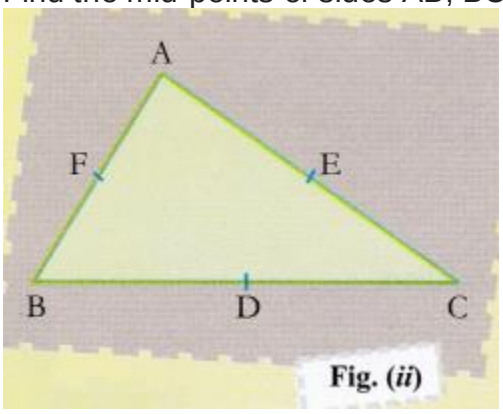
Materials Required
Coloured papers, a pair of scissors, pencil, geometry box, fevistick.

Procedure

1. Cut an acute angled triangle ABC from a coloured sheet of paper.



2. Find the mid-points of sides AB, BC and AC by paper folding.



3. Fold the triangle along AD, press it and unfold it, along BE, press it and unfold it, similarly fold the triangle along CF, fold it press it and unfold it.

4. We get three creases AD, BE and CE These three creases are called medians and they meet or intersect or pass through one point say G.

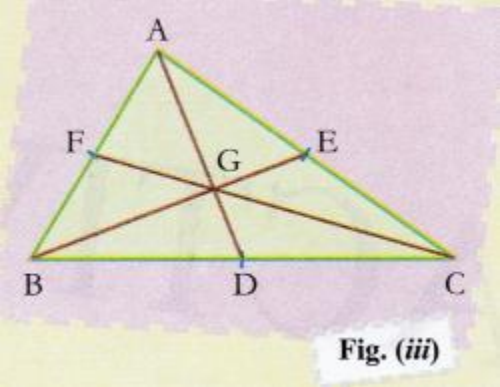


Fig. (*iii*)

5. This point G is known as the centroid of a ∆ABC.

Observation

1. We get three medians of ∆ABC as AD, BE and CF.
2. The point of concurrence is known as the centroid of a ∆ABC.

Result

All three medians in a triangle intersect at a point called the centroid of the triangle.

Learning Outcome

Medians of an acute-angled triangle concurred at a point known as centroid, which always lies inside the triangle

Activity Time

Verify that the centroid of an obtuse-angled triangle and a right-angled triangle always lie inside the triangle.

Viva Voce

Question 1.
Define centroid.
Answer:
It is the point of concurrence of all three medians of a triangle.

Question 2.
Is the centroid lie outside the triangle ?
Answer:
No. It always lies inside the triangle.

Question 3.
In what ratio, the centroid divides the median from vertex to mid-point of the opposite side ?
Answer:
2:1

Question 4.
Define median.
Answer:
A line segment joining a vertex to the mid-point of its opposite side is known as a median.

Question 5.
Tell the number of medians in a triangle.
Answer:
3

Question 6.
In an equilateral triangle PQR, G is the centroid. What is the relationship between the areas of ∆GPQ, ∆GQR and ∆GPR?
Answer:
ar (∆GPQ) = ar(∆GQR) = ar(∆GPR)

Question 7.
Are three angle bisectors of a triangle meet at a point ?
Answer:
Yes (at incentre)

Question 8.
Is it correct to say that all three medians in a triangle are same in length ?
Answer:
No

Multiple Choice Questions

Question 1.
In a triangle, the centroid divides medians of the triangle in the ratio
(a) 1:2
(b) 2:1
(c) 2:3
(d) none of these

Question 2.
In a triangle ABC, if BD and AE are two medians which intersect at M. If BM = 6 cm, what is the value of BD ?
(d) 10 cm
(b) 2 cm
(c) 9 cm
(d) none of these

Question 3.
In a triangle EFG, if EP and FQ are two median intersecting at M such that MP = 8 cm, then the value of EM will be ‘
(a) 16 cm
(b) 4 cm
(c) 12 cm
(d) none of these

Question 4.
If PM and QR are two medians intersecting inside the ∆PQS at the point G, such that QG = 5 cm, then GR will be
(a) 2.5 cm
(b) 10 cm
(c) 4.5 cm
(d) none of these

Question 5.
In a right triangle PQS right angled at Q if PQ = 4 cm, QS = 6 cm, and PR and QT are two medians intersecting at G, what will be the value of PG?
(a) $\frac{15}{2}$ cm
(b) $\frac{10}{3}$ cm
(c) $\frac{15}{3}$ cm
(d) none of these

Question 6.
In an isosceles right-angled triangle ABC, if the length of each of the two equal sides is 6 cm, and the two medians AP and CQ intersect at M, the value of MQ will be
(a) √5 cm
(b) 2√5 cm
(c) 5√5 cm
(d) none of these

Question 7.
In an equilateral triangle ABC of side 6 cm, if two medians BP and CQ intersect each other inside the triangle at G, then the length of median will be
(a) 3√ 3cm

(b) different in length
(c) $5\sqrt{3}$ cm
(d) none of these

Question 8.
In an isosceles triangle ABC, BD and CE are medians intersecting at M. If CE = 6 cm, what will be the value of other median BD ?
(a) 3 cm
(b) 6 cm
(c) 4 cm
(d) none of these

Question 9.
What will be the position of the centroid in an isosceles right-angled triangle ?
(d) inside
(b) outside
(c) on the triangle
(d) none of these

Question 10.
In an equilateral triangle, the lengths of three medians will be
(a) different
(b) can't say
(c) same
(d) none of these

Answers

1. (b)
2. (c)
3. (a)
4. (a)
5. (b)
6. (a)
7. (a)
8. (b)
9. (a)
10. (b)