

Module 9b: Centroid & Circumcenter of Triangles

Math Practice(s):

- Model with mathematics.
- Look for & express regularity in repeated reasoning.

Learning Target(s):

- Construct the centroid & circumcenter of a given triangle.
- Understand and apply the perpendicular bisector theorem.

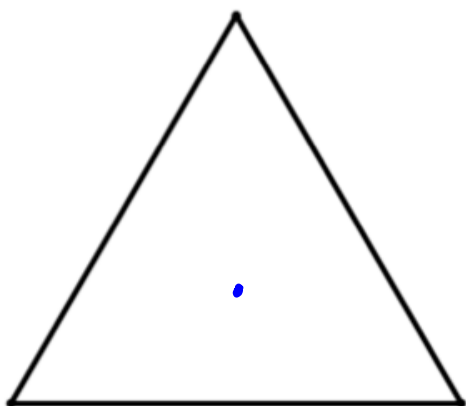
Homework:

HW#2: 9b #1-2

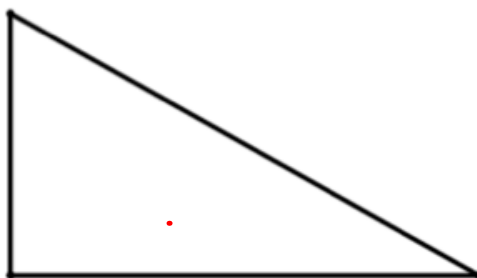
Warm-up

1. In each of the following triangles, make the best estimate you can to mark the point that represents the location of the center of the triangle. Work with a partner to discuss where the center of each triangle might be; you don't have to agree on the exact same point.

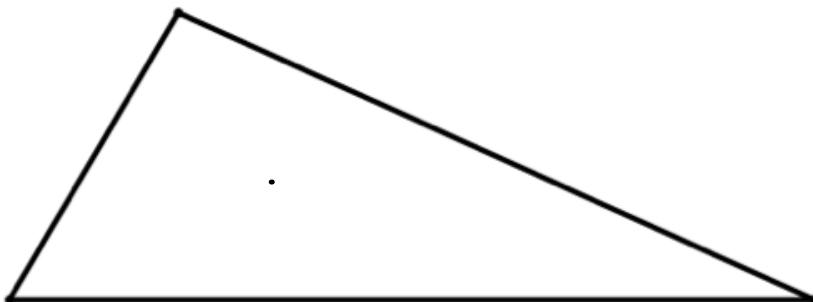
A.



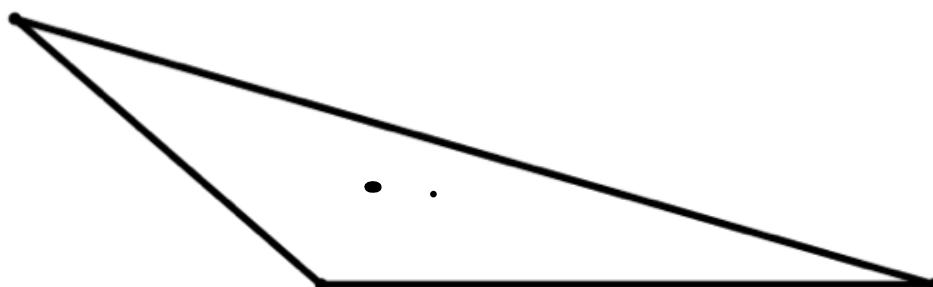
B.



C.



D.



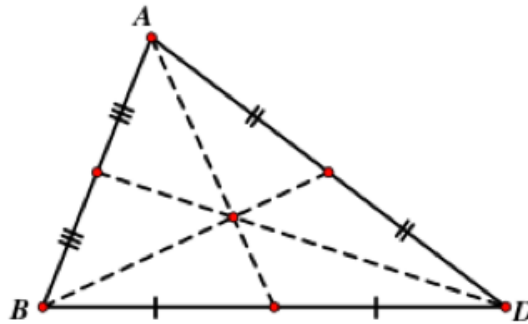
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Centroid of a Triangle

The **centroid** is the point of intersection of the three medians in a triangle.

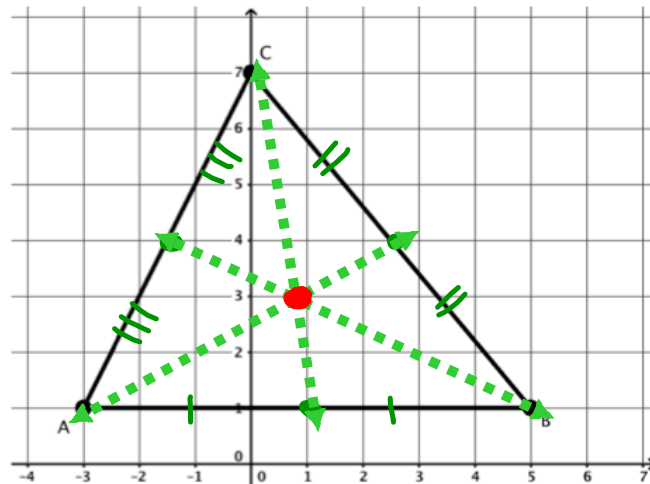
- The centroid is also referred to as the “center of mass”

or “balancing point” of the triangle.



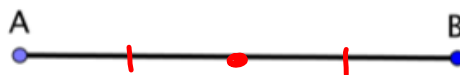
Example 1: Determine the location of the centroid of the triangle shown in the coordinate plane below.

- 1) Find midpoint of each segment.
- 2) Draw 3 medians.
- 3) Find the centroid (intersection of all medians).



Example 2: Determine the location of the centroid of each of the following triangles. Since these triangles are NOT given in the coordinate plane, use patty paper to find the median of each side of the triangles using the steps below.

To create a midpoint of \overline{AB} , follow the steps below:

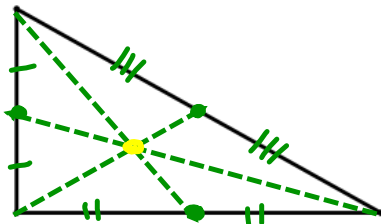


Step 1: Trace \overline{AB} onto the patty paper.

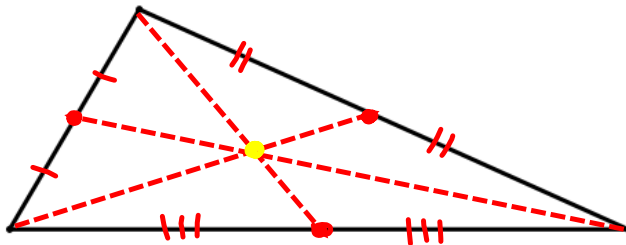
Step 2: Fold the patty paper so that points A and B are overlapping. Make a crease intersecting \overline{AB} .

Step 3: Draw a point at the intersection of the crease and \overline{AB} . This is your midpoint.

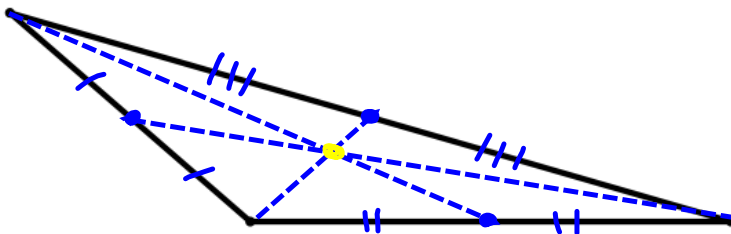
A.



B.



C.

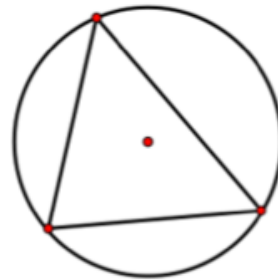
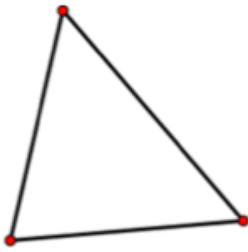


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Circumcenter of a Triangle

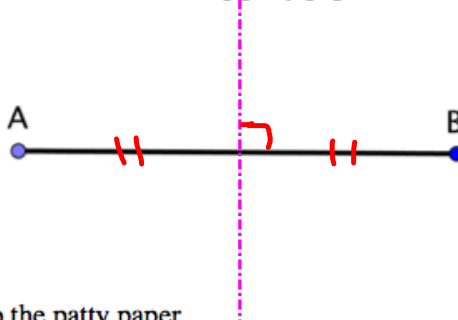
The **circumcenter** of a triangle is the center of the smallest circle _____ containing all three vertices of that triangle.

- The point of intersection of the three \perp _____ bisector _____ of a triangle.



Perpendicular Bisector Review

Construct the perpendicular bisector of \overline{AB} using patty paper in the following steps:



Step 1: Trace \overline{AB} onto the patty paper.

Step 2: Fold the patty paper so that points A and B are overlapping. Make a crease intersecting \overline{AB} .

Step 3: Draw a line, segment, or ray on the crease intersecting \overline{AB} . This is your perpendicular bisector.

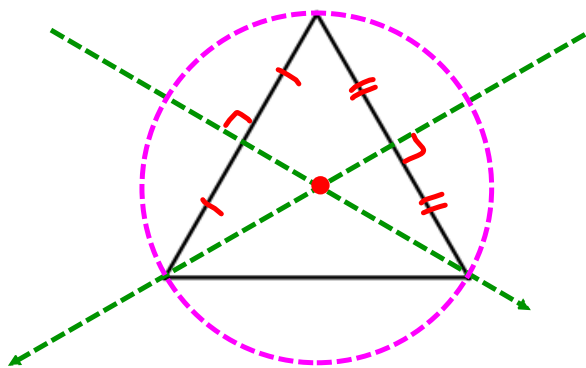
Back in Module 1f, we constructed a perpendicular bisector using a compass and measured the distance from each endpoint (points A and B above) to any point on the perpendicular bisector. This is known as the...

The Perpendicular Bisector Theorem

Given a line segment, \overline{AB} , any point on its perpendicular bisector is _____ equidistant _____ from A and B.

Example 3: Construct the perpendicular bisector of any two sides of the triangles. Then, identify the circumcenter of the triangle and use a compass to draw the smallest circle that contains all three vertices of the triangle. Attach your patty paper to this page.

A.



B.

