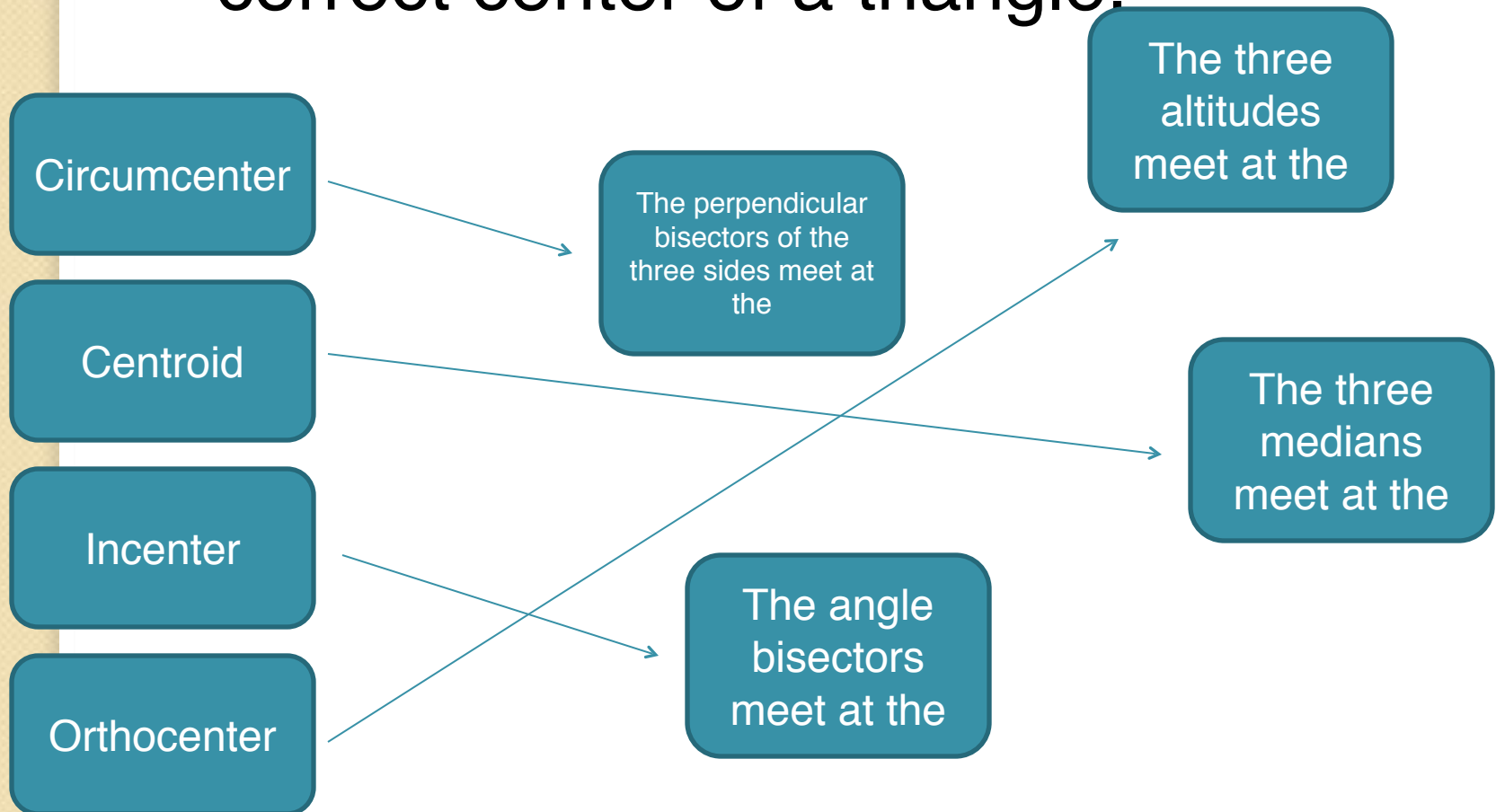


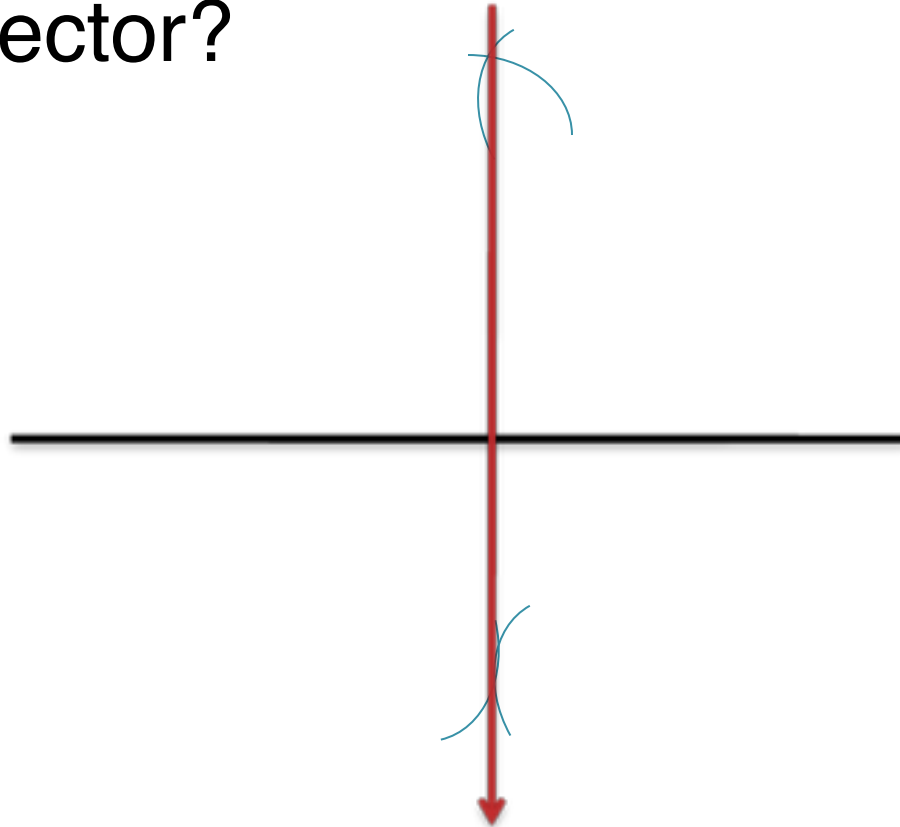
Aim: The four centers of a triangle

Do Now: Match the description with the correct center of a triangle.



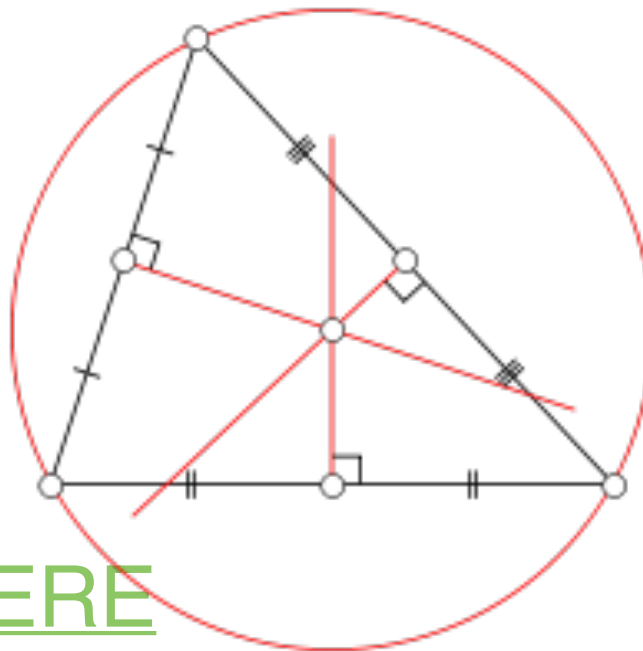
Circumcenter

- Perpendicular bisectors
- How do you draw a perpendicular bisector?



Circumcenter

- What is a circumcenter?
- Hint: What is it the center of?



[CLICK HERE](#)

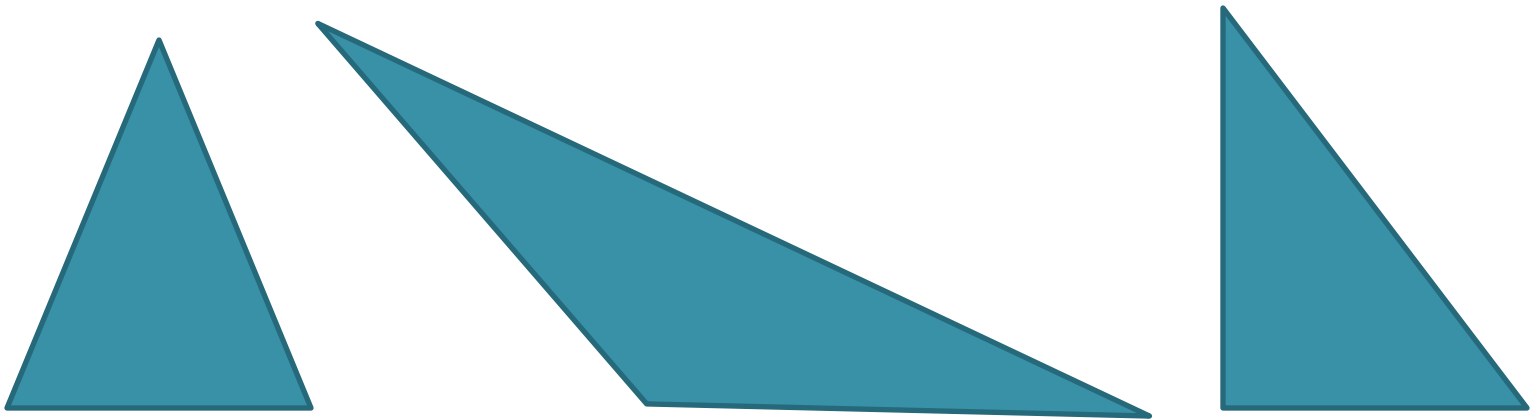
Circumcenter

- Where is the circumcenter located on
 - a) An acute triangle
 - b) An obtuse triangle
 - c) A right triangle

Inside the triangle

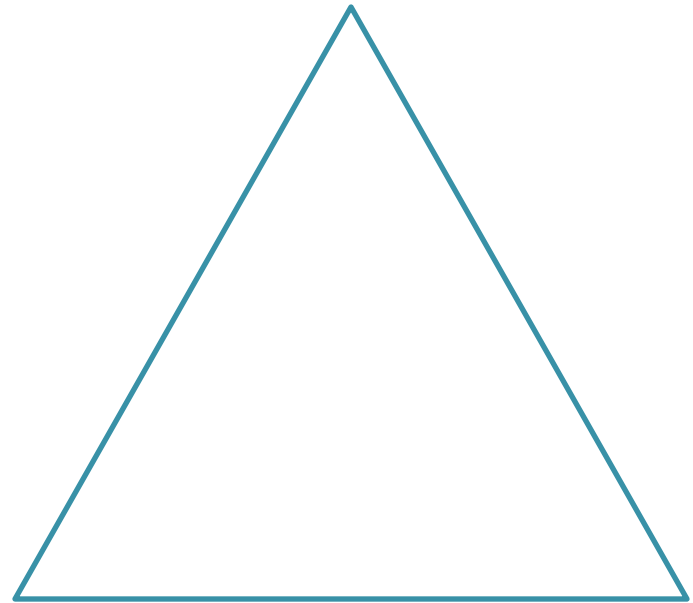
Outside the triangle

On the triangle



Centroid

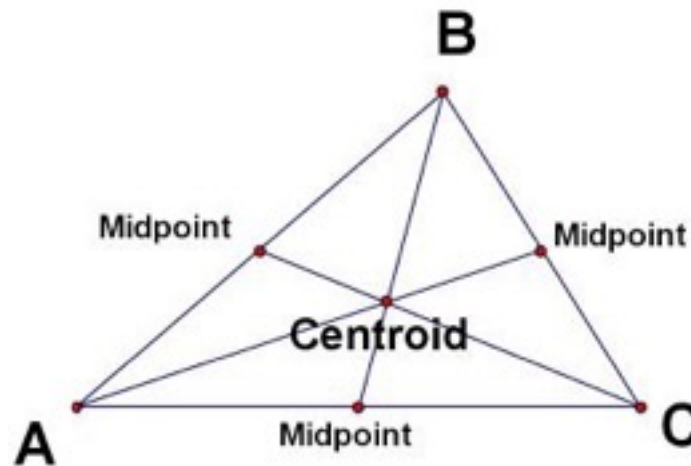
- Medians
- How do you draw a median?



- [CLICK HERE](#)

Centroid

- What is special about the medians that make a centroid?
- Hint: There is a ratio involved

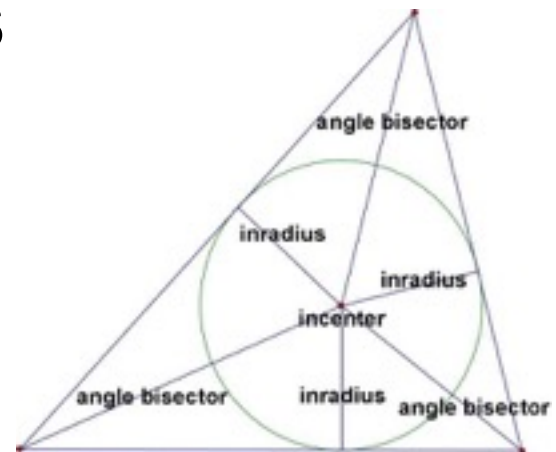


Centriod

- When is the centriod outside the triangle?
 - A. When the triangle is acute
 - B. When the triangle is obtuse
 - C. When the triangle is right
 - D. Never

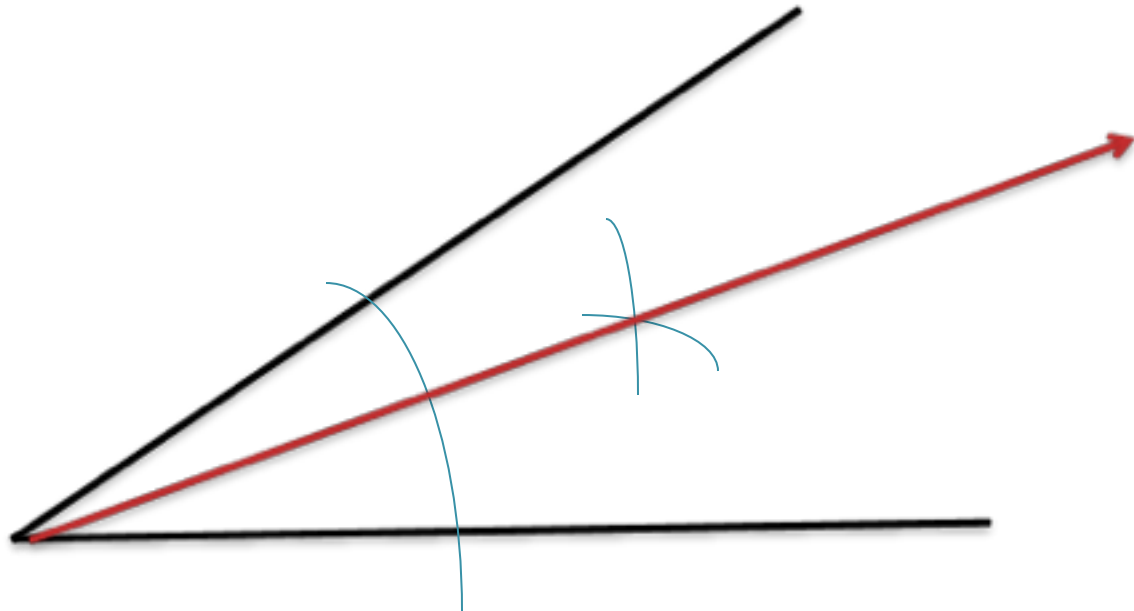
Incenter

- Formed by:
- Angle Bisectors
- What is special about the incenter?
- It is the center of a triangle that tangents all the sides



Incenter

- Formed by angle bisectors
- Bisect this angle



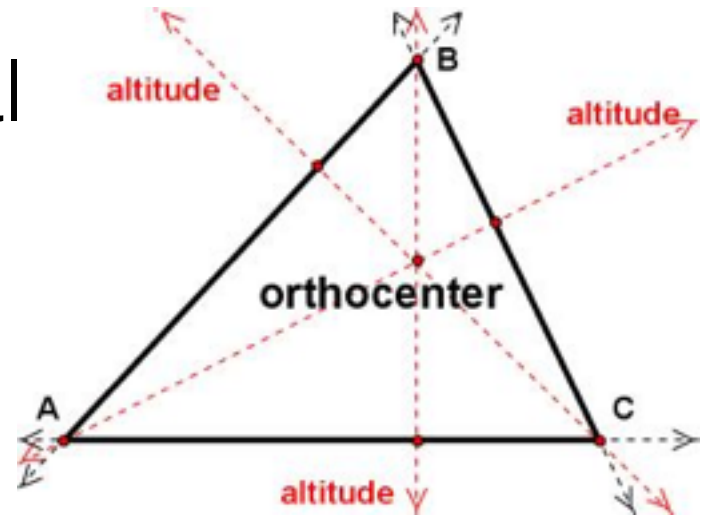
Properties of the Incenter

- The incenter is the center of the triangle's incircle, the largest circle that will fit inside the triangle and touch all three sides.
- Always inside the triangle

[CLICK HERE](#)

Orthocenter

- What forms an orthocenter?
- Altitudes
- Shortcut:
- Instead of drawing all three altitudes two will also show the accurate orthocenter



Orthocenter

- The orthocenter is not always inside the triangle. If the triangle is obtuse, it will be outside.
- If the triangle is right it will be on the vertex of the right angle
- [CLICK HERE](#)

Regents Problem 😊

1. The point where the medians of a triangle are concurrent is called the

- | | | |
|--------------|------------------|-----|
| [1] centroid | [2] orthocenter | [3] |
| incenter | [4] circumcenter | |

2. The centroid of a triangle divides the medians into ratios of

| | | |
|---------|---------|---------|
| [1] 2:1 | [2] | |
| 3:1 | [3] 4:1 | [4] 5:1 |

Regents Problems

3. The circumcenter of an acute triangle is located inside the triangle. The circumcenter of an obtuse triangle is located outside the triangle. Where is the circumcenter of a **right** triangle located in relation to the triangle?

- [1] on the triangle
- [2] outside the triangle
- [3] inside the triangle
- [4] the location varies

4. The orthocenter of a triangle is always located inside the triangle.

- [1] TRUE
- [2] FALSE

Regents Problems

5. It is possible to inscribe a circle in any shaped quadrilateral.

[1] TRUE

[2] FALSE

6. The point of concurrence of the angle bisectors of a triangle is always located inside the triangle.

[1] TRUE

[2] FALSE

Regents Problems

7. The point of concurrence of the perpendicular bisectors of a triangle is always located inside the triangle.

[1] TRUE

[2] FALSE

8. The centroid of a triangle is located 12 units from one of the vertices of a triangle. Find the length of the median of the triangle drawn from that same vertex.

[1] 16

[2] 18

[3] 24

[4] 36