

NAME: _____



Angle and \perp Bisectors In Triangles

Open the file: *Bisectors In Triangles*

Definition of an angle bisector (in a triangle):

On Page 1.2

Draw an angle bisector from point C

- , Geometry, Construction, Angle Bisector
- Click on points A, then C, then B
- Then press 

Find the point of intersection on the opposite side of the triangle, label it D

Grab and move $\angle C$, to make observations about point D.

On Page 1.3

- Construct the angle bisectors through each vertex, to each side of $\triangle ABC$.
- Find the point of intersection, of the three angle bisectors and label it I.

This point is a **point of concurrency** and has a special name, **INCENTER**

Grab point C and move it while you make observations for answering the following questions:

1. Does the Incenter always appear inside the triangle? _____
2. Move C so that $\triangle ABC$ is an acute triangle. Describe the placement of the Incenter:

3. Move C so that $\angle A$ or $\angle B$ is obtuse. Describe the placement of the Incenter:

4. Move C so that $\angle C$ is the vertex angle of an isosceles triangle. Describe the placement of the Incenter:

5. Move C so that $\angle A$ is the right angle in a right triangle. Describe the placement of the Incenter:

On page 2.1:

Definition of a perpendicular bisector (in a triangle):

On Page 2.2

Find the midpoint of \overline{AB}

- Ⓜ, Geometry, Construction, Midpoint
- Click \overline{AB} , then label the midpoint D

Draw a perpendicular bisector from point D

- Ⓜ, Geometry, Construction, Perpendicular
- Click on points D, twice
- Then press ⓔ

Grab and move $\angle A$ or $\angle B$, to make observations about point D.

On Page 2.3

Construct the perpendicular bisectors for each side of $\triangle ABC$.

- Ⓜ, Geometry, Construction, Perpendicular Bisector
- Click on each side of the triangle
- Then press ⓔ

Find the point of intersection, of the three angle bisectors and label it **C**.

This point is a **point of concurrency** and has a special name, **Circumcenter**

Grab point C and move it while you make observations for answering the following questions:

6. Does the Circumcenter always appear inside the triangle? _____
7. Move C so that $\triangle ABC$ is an acute triangle. Describe the placement of the Circumcenter:

8. Move C so that $\angle A$ or $\angle B$ is obtuse. Describe the placement of the Circumcenter:

9. Move C so that $\angle C$ is the vertex angle of an isosceles triangle. Describe the placement of the Circumcenter:

10. Move C so that $\angle A$ is the right angle in a right triangle. Describe the placement of the Circumcenter:
