Warm Up

1. Find the coordinates of the centroid of ΔABC.

$A(5, 5)$ $B(-1, 1)$ $C(11, -3)$

(5, 1)

2. What is true about the circumcenter of a triangle?

equidistant from vertices

3. What is true about the incenter of a triangle?

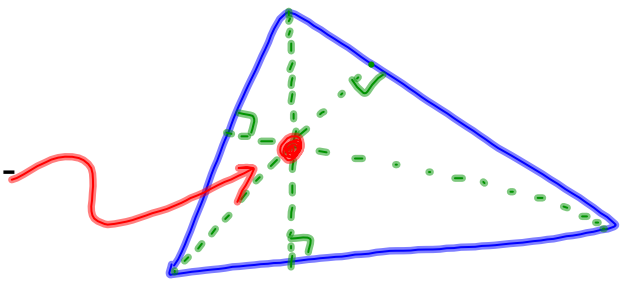
equidistant from sides

5-4 Using Altitudes

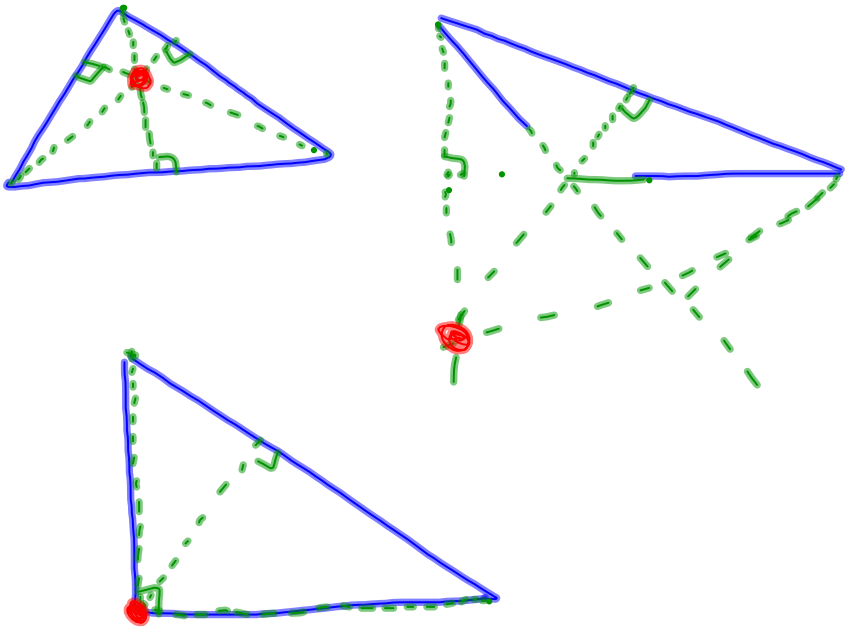
altitude of a triangle - height, must be perpendicular

concurrency of the altitudes of a triangle -

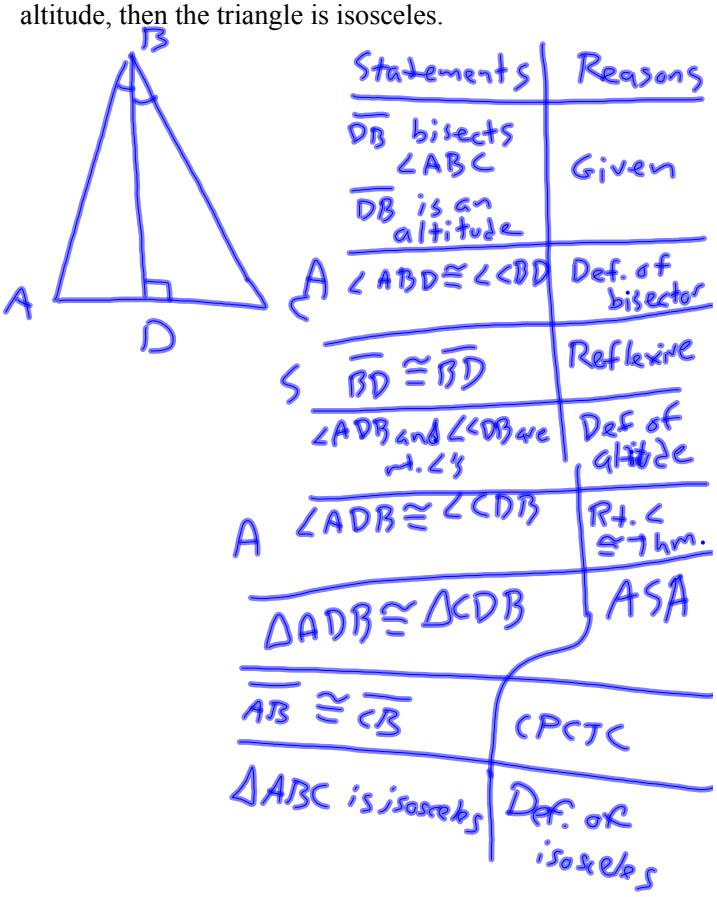
orthocenter -



Ex 1 Show that the orthocenter can be inside, on, or outside the triangle.

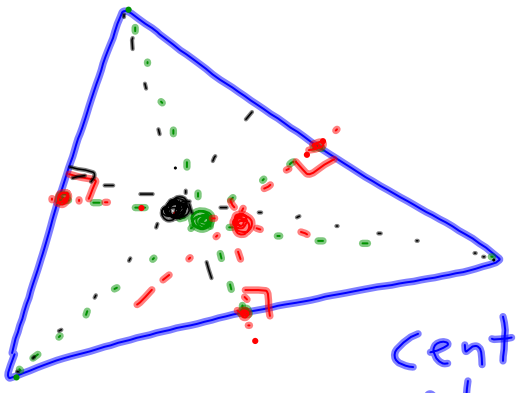


Ex 2 Prove that if an angle bisector of a triangle is also an altitude, then the triangle is isosceles.



Ex. 3 List the four types of concurrency introduced in this chapter, make a sketch of each, and explain what is true about each of these points.

Ex. 4 Sketch a triangle. Sketch its centroid, circumcenter, and orthocenter. What do you notice about these three points?



centroid, circumcenter, and orthocenter are always in a straight line

Euler Line

Euler line - the line containing the circumcenter, centroid, and orthocenter

The centroid divides the line segment in the ratio 2:1