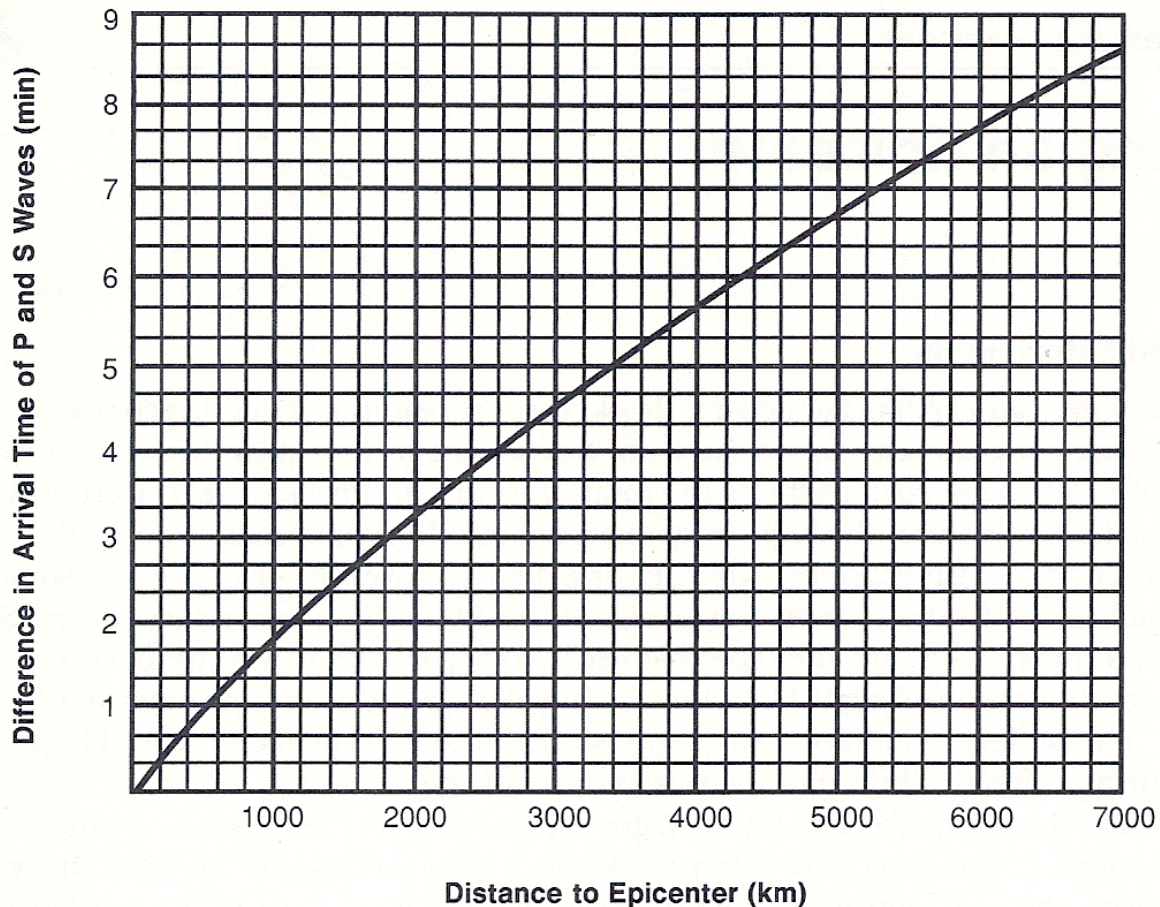


# Epicenter Triangulation

Triangulation is one method scientists use to locate the epicenter of an earthquake. The epicenter is the location at the surface of the Earth that represents the focus inside the Earth where the earthquake originates on a fault line.

Triangulation requires seismic information from three different recording stations. Scientists are able to record how long it takes seismic waves to reach a recording station. This information is converted into a length measurement to find the distance from the station to the epicenter. Circles are drawn with the radius equaling the distance from the station to the epicenter. Earthquakes can occur at any point on the circle, however, when three separate circles are drawn, the circles will intersect at one point, which represents the epicenter of the earthquake.

Figure 1



The dark arc represents the difference in arrival time of the P and S wave speeds.

## OUR SCENARIO

1. An earthquake has occurred this morning at 2:25 am Pacific Standard Time. The times of arrival of the P and S waves were recorded by seismographs located at the three cities listed in the Data Table.
2. Using Figure 1, determine each city's distance from the earthquake epicenter. Enter your figures in the Data Table.
3. On the triangulation map, use the distance scale to set your compass at a radius equal to the distance from each city to the epicenter.
4. Draw a circle with the radius determined in step 5, using Denver as the center.
5. Repeat for Houston and Miami.
6. The three circles will intersect at one point. This point marks the epicenter of the earthquake.

## DATA TABLE

City	Difference in Arrival Times of P and S Waves	Distance in Km from epicenter
Denver	2 min 25 sec	
Houston	4 min 10 sec	
Miami	5 min 40 sec	

1. Which city on the map is closest to the earthquake's epicenter? \_\_\_\_\_
2. How far is this city from the epicenter? \_\_\_\_\_
3. Where is the epicenter of the earthquake located? \_\_\_\_\_  
\_\_\_\_\_
4. Why is it necessary to have data from at least three recording stations to be able to locate the epicenter? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

