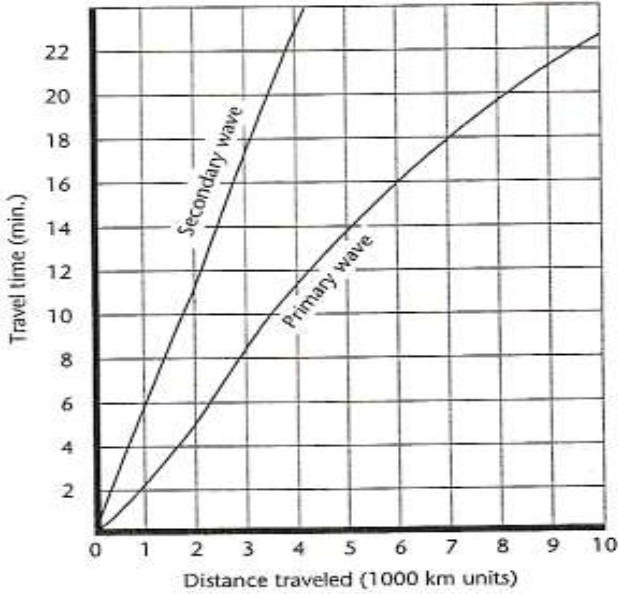
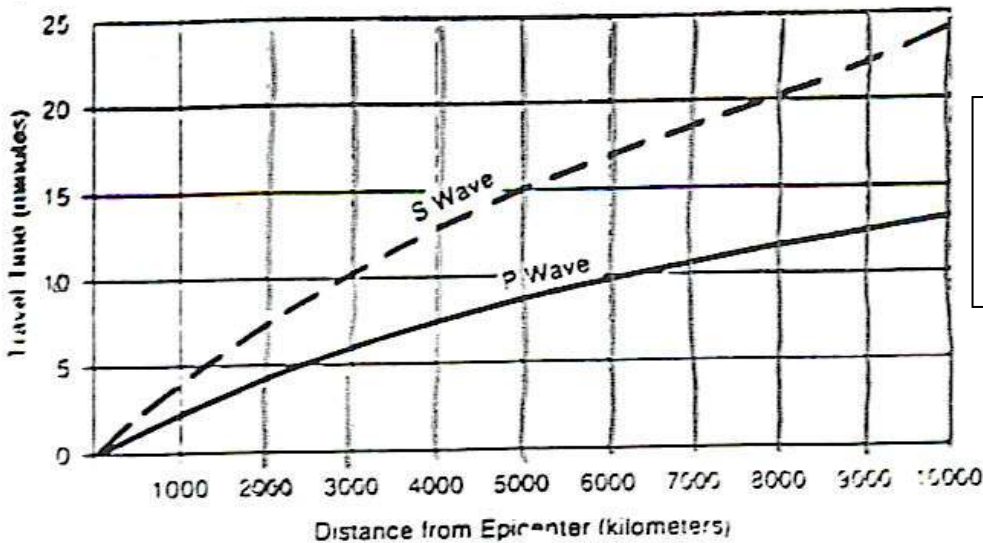


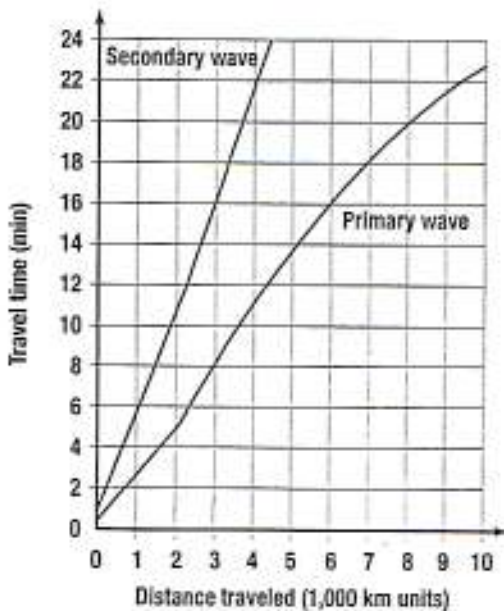
## Earthquakes Practice: Time-travel graphs and Seismographs



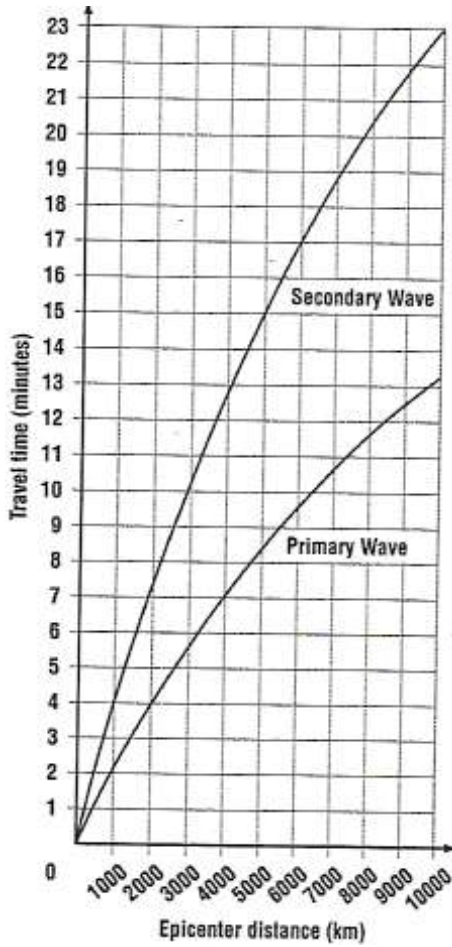
1. How long does it take for a primary wave to travel 2000 km?  
\_\_\_\_\_
2. How long does it take for a secondary wave to travel 2000 km?  
\_\_\_\_\_
3. How far does a secondary wave travel in 10 minutes?  
\_\_\_\_\_
4. How far does a primary wave travel in 10 minutes?  
\_\_\_\_\_
5. How much lag time between the two waves will there be at 4000 km? \_\_\_\_\_
6. Suppose both waves start together and travel for 5 minutes. Which wave will travel the farthest? \_\_\_\_\_



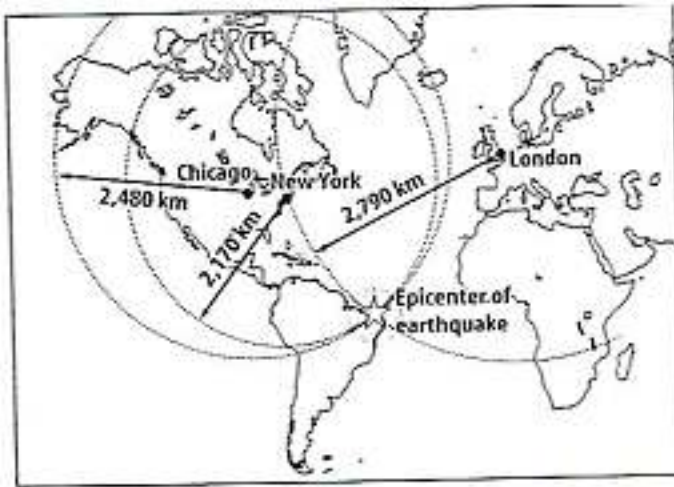
1. How long will it take a P wave to travel 8000km?  
\_\_\_\_\_
2. A P wave arrives at 3:00pm. If the S waves arrive at the seismograph station at 3:10pm, approximately how far was the earthquake from the station? \_\_\_\_\_



1. How long will it take a P wave to travel 9000 km? \_\_\_\_\_
2. An earthquake occurs at 4:00pm. If the P waves arrive at the seismograph station at 4:10pm **and the S wave at 4:13pm**, approximately how far was the earthquake from the station? \_\_\_\_\_
3. How far does a S wave travel in 22 minutes? \_\_\_\_\_
4. P waves first arrive at a station 5000 km away from the epicenter of the earthquake. How long did it take them to travel there? \_\_\_\_\_



1. What is the difference in seismic wave arrival time if the epicenter is 5000 km away? \_\_\_\_\_
2. How far away is the epicenter if P waves take 12 minutes to get there? \_\_\_\_\_
3. It takes a P wave 6 minutes to reach a seismograph station that is \_\_\_\_\_ km away.
4. What happens to the time difference between primary and secondary waves as the distance traveled gets longer? Why?  
 \_\_\_\_\_  
 \_\_\_\_\_



1. On which continent did the earthquake occur? \_\_\_\_\_
2. How far was the earthquake from London? \_\_\_\_\_
3. How far was the earthquake from New York? \_\_\_\_\_
4. How far was the earthquake from Chicago? \_\_\_\_\_
5. How long did it take for the primary waves to reach Chicago? \_\_\_\_\_
6. Approximately, how long would it take for secondary waves to reach London? \_\_\_\_\_

Distance from epicenter (km)	Primary waves		Secondary waves		Surface waves	
	min	s	min	s	min	s
620	3	20	6	0	7	20
1,240	5	56	10	48	14	16
1,860	8	00	14	30	21	30
2,480	9	50	17	50	27	50
3,100	11	26	20	51	35	56
3,720	12	43	23	27	41	43