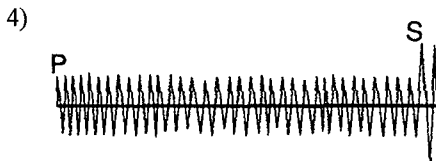
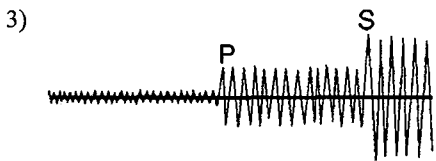
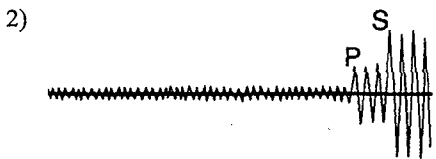
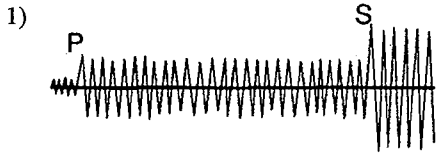


Name _____

Earthquake calculations

1. A seismic station recorded the arrival of a *P*-wave at 10:00:00 a.m. The *S*-wave arrival was recorded at 10:09:20 a.m. What is the approximate distance between the earthquake epicenter and the seismic station?
- 1) 1.1×10^3 km 3) 2.9×10^3 km
2) 2.2×10^3 km 4) 7.2×10^3 km

2. The diagrams below represent seismograms of the same earthquake recorded in four different locations. Which seismogram was recorded farthest from the epicenter of the earthquake?



3. A seismic station recorded the arrival of a *P*-wave at 10:00:40 a.m. The *S*-wave arrival was recorded at 10:08:20 a.m. What is the approximate distance between the earthquake epicenter and the seismic station?
- 1) 1.1×10^3 km 3) 6.0×10^3 km
2) 2.2×10^3 km 4) 7.2×10^3 km

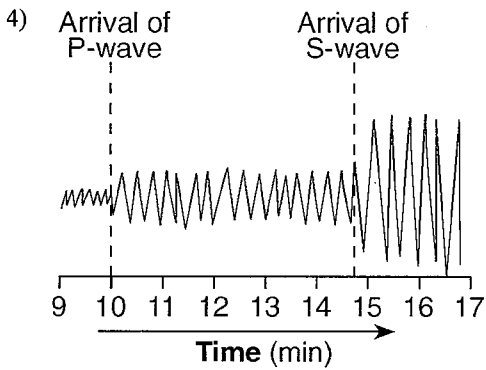
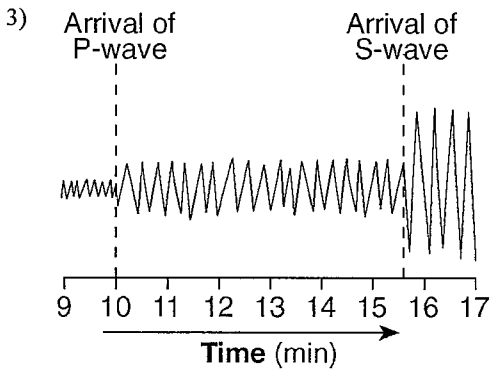
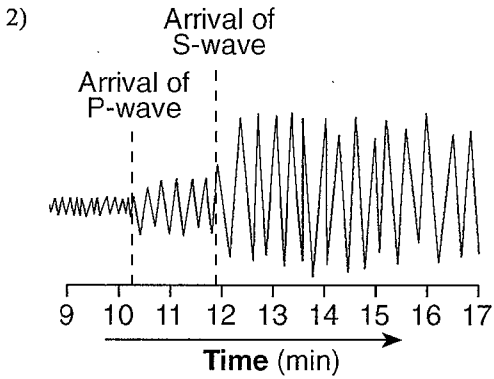
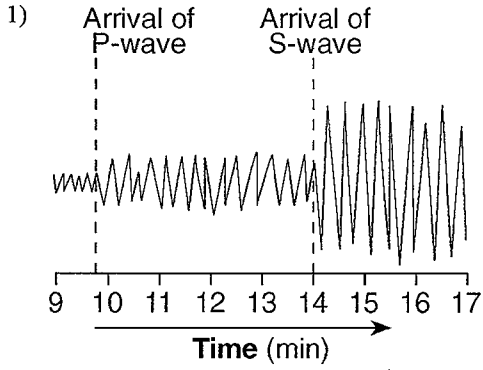
4. The epicenter of an earthquake is 3,600 kilometers from an observation point. What is the difference in travel time for the *P*-waves and *S*-waves?
- 1) 7 min 35 sec 3) 13 min 10 sec
2) 5 min 20 sec 4) 17 min 00 sec

5. An earthquake occurs at 12:02 p.m. A seismic station records the first *S*-wave at 12:19 p.m. Which set of data shows the approximate arrival time of the first *P*-wave and the distance to the epicenter?
- 1) 12:11:25 p.m. and 4000 km
2) 12:11:25 p.m. and 6000 km
3) 12:19:40 p.m. and 4000 km
4) 12:19:40 p.m. and 6000 km

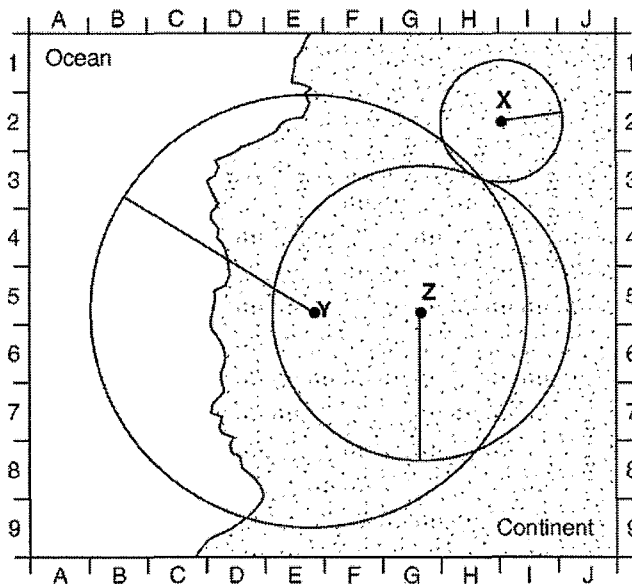
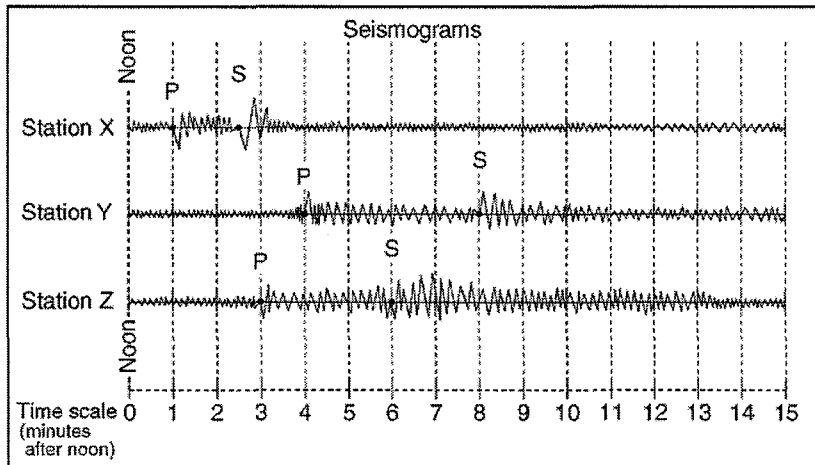
6. A seismograph station recorded the arrival of the first *P*-wave at 7:32 p.m. from an earthquake that occurred 4000 kilometers away. What time was it at the station when the earthquake occurred?
- 1) 7:20 p.m. 3) 7:32 p.m.
2) 7:25 p.m. 4) 7:39 p.m.

7. An earthquake's *P*-wave traveled 4,800 kilometers and arrived at a seismic station at 5:10 p.m. At approximately what time did the earthquake occur?
- 1) 5:02 p.m. 3) 5:10 p.m.
2) 5:08 p.m. 4) 5:18 p.m.

8. Which seismogram was recorded approximately 4,000 kilometers from an earthquake epicenter?



Base your answers to questions 9 and 10 on the diagram and map below. The diagram shows three seismograms of the same earthquake recorded at three different seismic stations, X, Y, and Z. The distances from each seismic station to the earthquake epicenter have been drawn on the map. A coordinate system has been placed on the map to describe locations. The map scale has not been included.



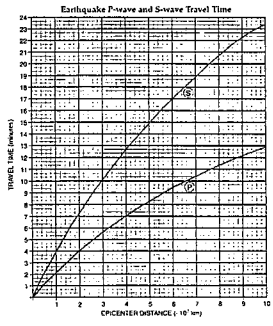
9. On the map, which location is closest to the epicenter of the earthquake?

- 1) E-5 2) G-1 3) H-3 4) H-8

10. Approximately how far away from station Y is the epicenter?

- 1) 1,300 km 2) 2,600 km 3) 3,900 km 4) 5,200 km

Reference Tables



Name

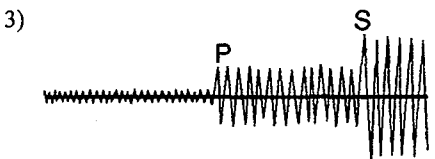
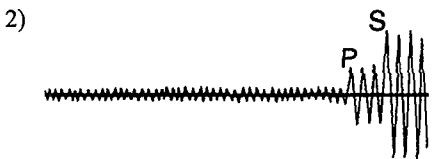
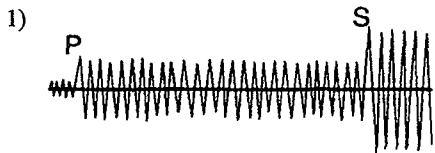
Key

Earthquake calculations

1. A seismic station recorded the arrival of a *P*-wave at 10:00:00 a.m. The *S*-wave arrival was recorded at 10:09:20 a.m. What is the approximate distance between the earthquake epicenter and the seismic station?

- 1) 1.1×10^3 km 3) 2.9×10^3 km
 2) 2.2×10^3 km 4) 7.2×10^3 km
 7.8×10^3

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3. A seismic station recorded the arrival of a *P*-wave at 10:00:40 a.m. The *S*-wave arrival was recorded at 10:08:20 a.m. What is the approximate distance between the earthquake epicenter and the seismic station?

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- 1) 7:20 p.m. 3) 7:32 p.m.
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- 1) 5:02 p.m. 3) 5:10 p.m.
 2) 5:08 p.m. 4) 5:18 p.m.

8 min
P wave
 Travel Time

1)

H	M	S
10	09	20
10	00	00
0	09	20

7)

H	M	S
5	10	00
-	08	00
5	02	00

3)

H	M	S
10	08	20
10	00	40
00	07	40

5)

H	M	S
12	19	00
-	12	02
	17	00

H	M	S
12	02	00
+	09	30
12	11	30

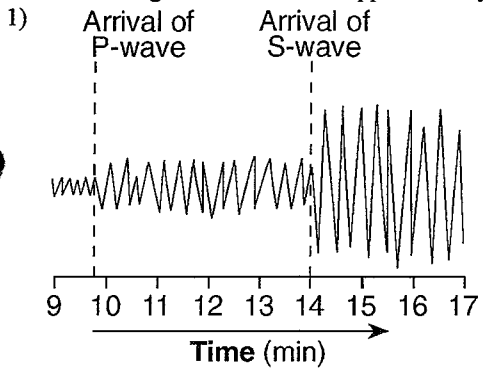
→ *P* wave
 Travel time

6)

H	M	S
7	32	00
-	0	7
7	25	00

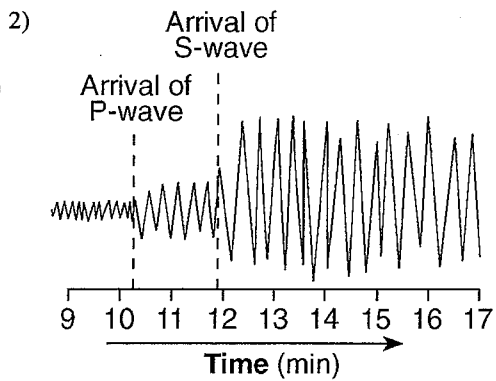
P wave
 Travel time

8. Which seismogram was recorded approximately 4,000 kilometers from an earthquake epicenter?



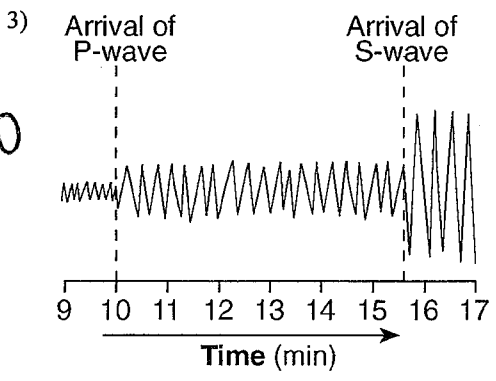
L → 5 min
40 sec difference
b/w P+S wave

4:20

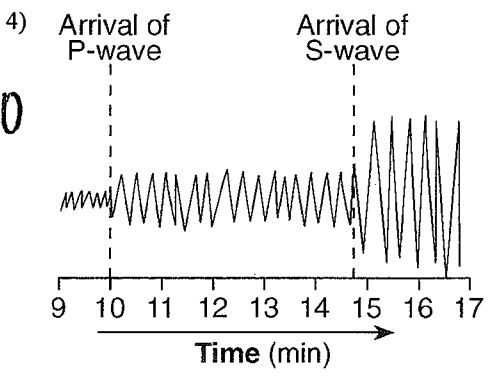


1:40

3

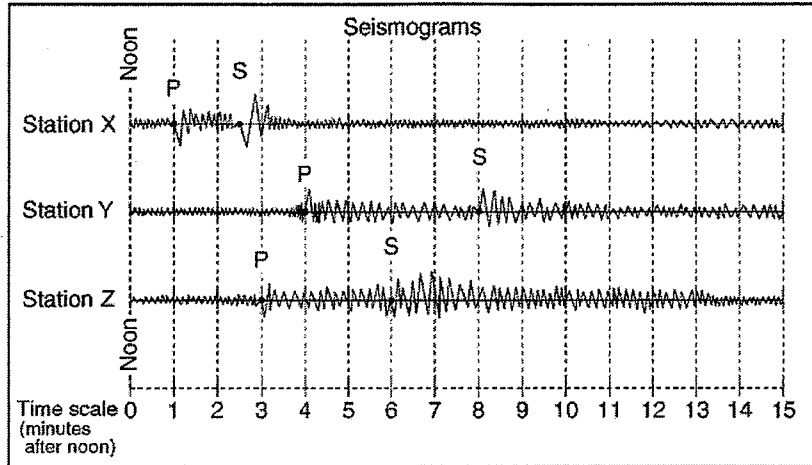


5:40

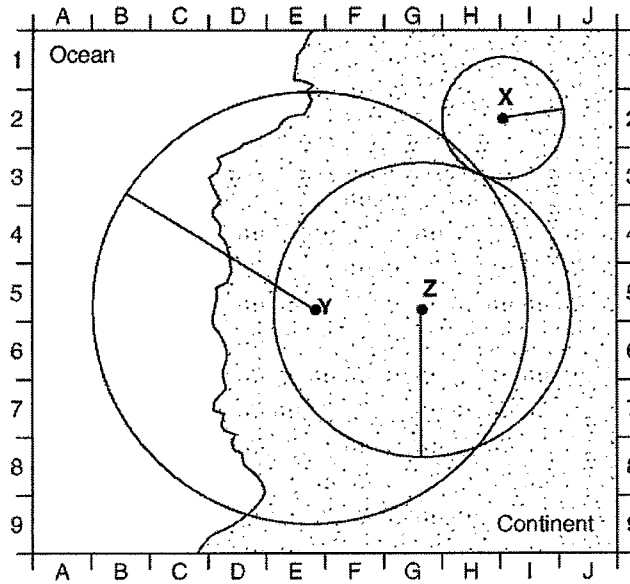


4:40

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4 min difference



9. On the map, which location is closest to the epicenter of the earthquake?

1) E-5

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3

2

Reference Tables

