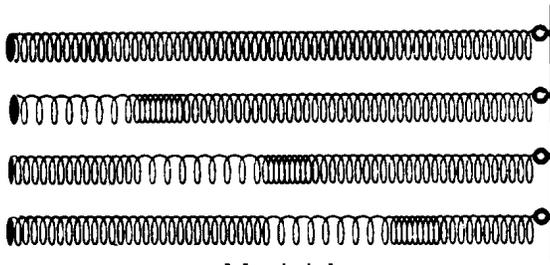
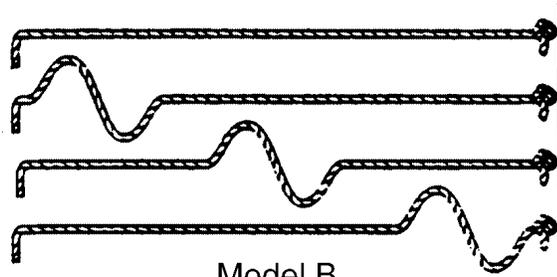


Midterm Prep-Earthquakes

1. Base your answer to the following question on the diagram below, which shows models of two types of earthquake waves.



Model A



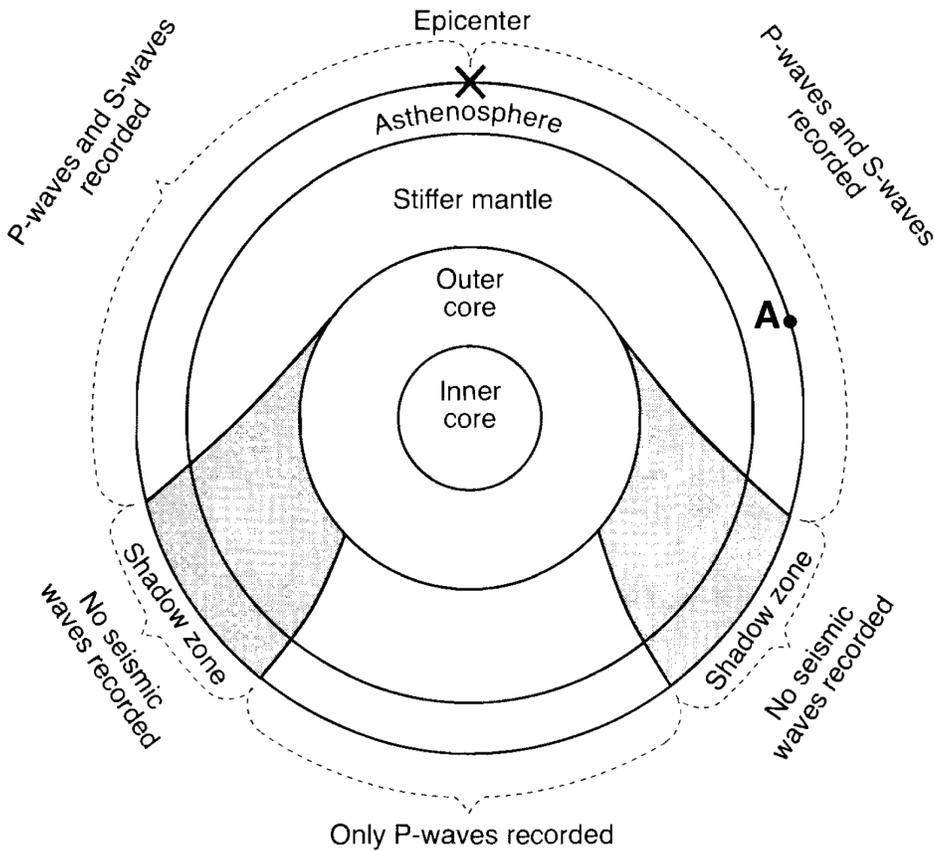
Model B

Model A best represents the motion of earthquake waves called

- A) *P*-waves (compressional waves) that travel faster than *S*-waves (shear waves) shown in model B
 - B) *P*-waves (compressional waves) that travel slower than *S*-waves (shear waves) shown in model B
 - C) *S*-waves (shear waves) that travel faster than *P*-waves (compressional waves) shown in model B
 - D) *S*-waves (shear waves) that travel slower than *P*-waves (compressional waves) shown in model B
-

Midterm Prep-Earthquakes

2. Base your answer to the following question on the cross section below, which shows the type of seismic waves recorded at various locations after an earthquake has occurred. Point *A* is a location on Earth's surface and *X* is the epicenter of the earthquake.



(Not drawn to scale)

Point *A* is located 7600 kilometers from the epicenter of this earthquake. How many minutes did it take the first S-wave to reach point *A*?

- A) 9 min B) 11 min C) 16 min D) 20 min

Midterm Prep-Earthquakes

Base your answers to questions 3 and 4 on the diagrams below. Diagram 1 represents a cross section of Earth and its interior layers. The asterisk (*) shows the location of an earthquake epicenter. Letters *A* through *D* are seismic stations on Earth's surface. Diagram 2 shows four seismograms labeled I, II, III, and IV, which were recorded at seismic stations *A*, *B*, *C*, and *D* during the same time interval.

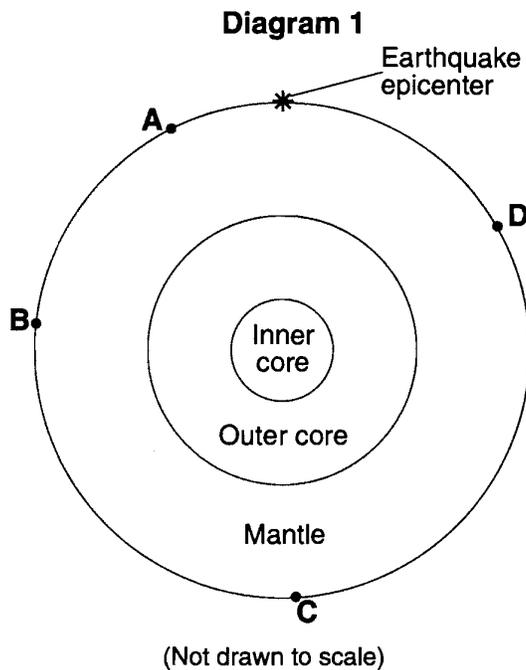
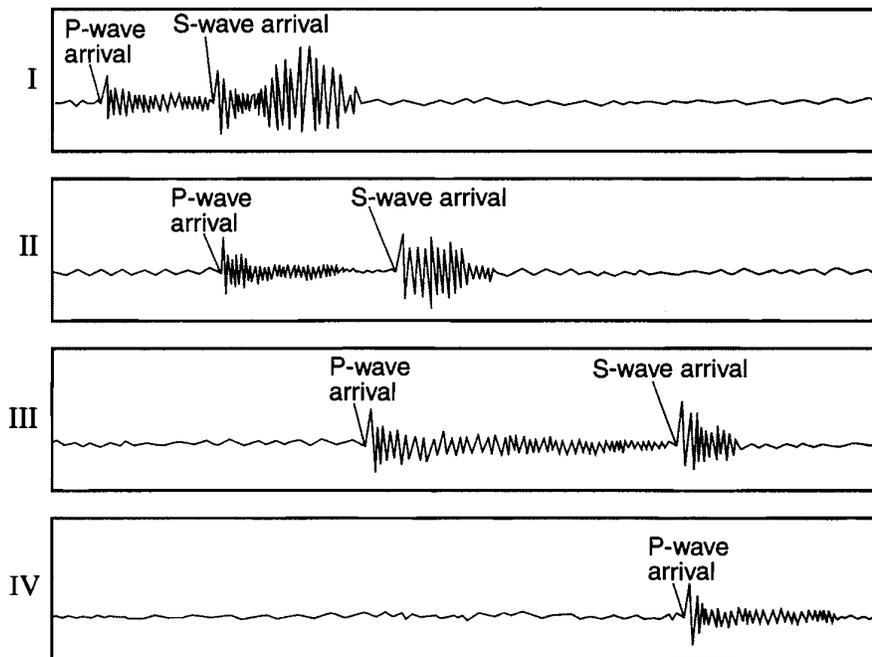


Diagram 2



3. Station *D* is 8000 kilometers from the earthquake epicenter. How long did it take for the first *P*-wave to travel from the epicenter to station *D*?

- A) 9 minutes 20 seconds B) 11 minutes 20 seconds
C) 20 minutes 40 seconds D) 4 minutes 20 seconds

Midterm Prep-Earthquakes

4. Which list correctly matches the seismograms with the seismic stations where they were recorded?

A) seismogram I - station *A*

seismogram II - station *B*

seismogram III - station *C*

seismogram IV - station *D*

B) seismogram I - station *B*

seismogram II - station *D*

seismogram III - station *A*

seismogram IV - station *C*

C) seismogram I - station *C*

seismogram II - station *B*

seismogram III - station *D*

seismogram IV - station *A*

D) seismogram I - station *A*

seismogram II - station *D*

seismogram III - station *B*

seismogram IV - station *C*

5. The first S-wave arrived at a seismograph station 11 minutes after an earthquake occurred. How long after the arrival of the first P-wave did this first S-wave arrive?

A) 3 min 15 s

B) 4 min 55 s

C) 6 min 05 s

D) 9 min 00 s

6. Which statement correctly compares seismic P-waves with seismic S-waves?

A) P-waves travel faster than S-waves and pass through Earth's liquid zones.

B) P-waves travel faster than S-waves and do not pass through Earth's liquid zones.

C) P-waves travel slower than S-waves and pass through Earth's liquid zones.

D) P-waves travel slower than S-waves and do not pass through Earth's liquid zones.

7. An earthquake's first P-wave arrives at a seismic station at 12:00:00. This P-wave has traveled 6000 kilometers from the epicenter. At what time will the first S-wave from the same earthquake arrive at the seismic station?

A) 11:52:20

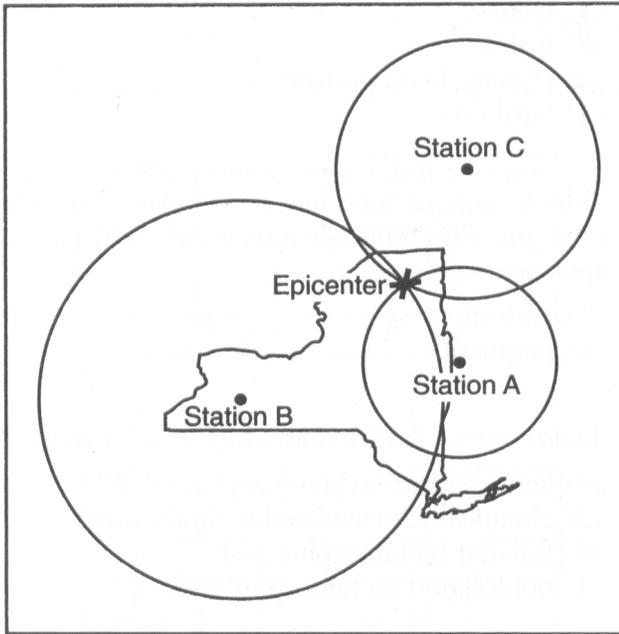
B) 12:07:40

C) 12:09:20

D) 12:17:00

Midterm Prep-Earthquakes

8. The map below shows the location of an earthquake epicenter in New York State. Seismic stations *A*, *B*, and *C* received the data used to locate the earthquake epicenter.



The seismogram recorded at station *A* would show the

- A) arrival of *P*-waves, only
 - B) earliest arrival time of *P*-waves
 - C) greatest difference in the arrival times of *P*-waves and *S*-waves
 - D) arrival of *S*-waves before the arrival of *P*-waves
9. A seismic station is recording the seismic waves produced by an earthquake that occurred 4200 kilometers away. Approximately how long after the arrival of the first *P*-wave will the first *S*-wave arrive?
- A) 1 min 05 sec
 - B) 5 min 50 sec
 - C) 7 min 20 sec
 - D) 13 min 10 sec
10. A *P*-wave takes 8 minutes and 20 seconds to travel from the epicenter of an earthquake to a seismic station. Approximately how long will an *S*-wave take to travel from the epicenter of the same earthquake to this seismic station?
- A) 6 mm 40 sec
 - B) 9 mm 40 sec
 - C) 15 mm 00 sec
 - D) 19 mm 00 sec

11. A seismic station 4000 kilometers from the epicenter of an earthquake records the arrival time of the first *P*-wave at 10:00:00. At what time did the first *S*-wave arrive at this station?

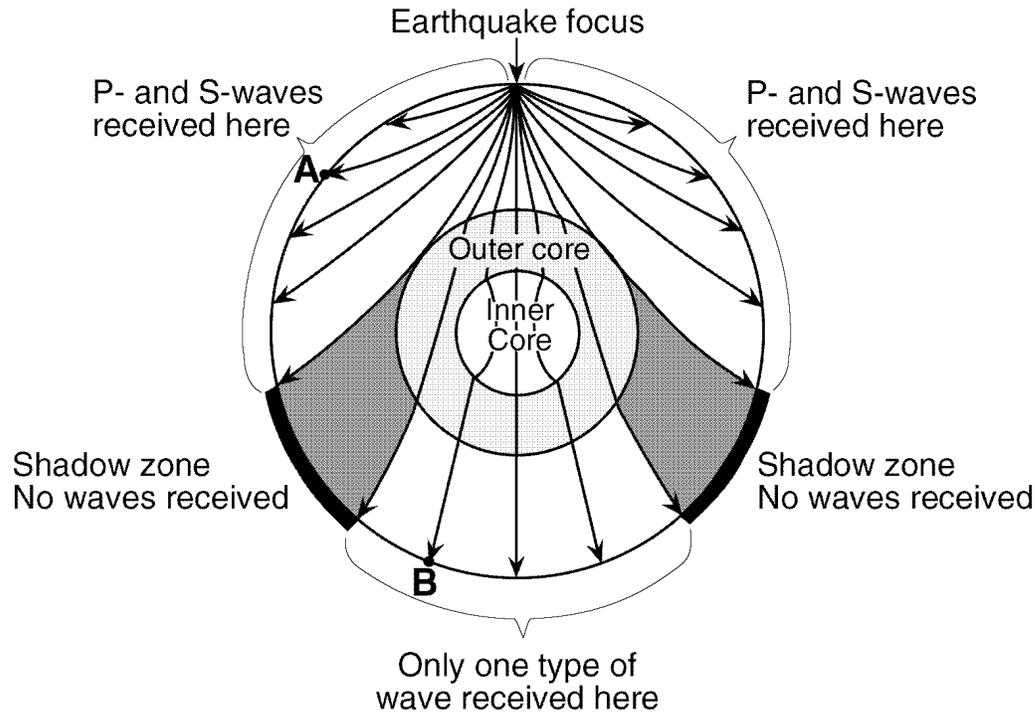
- A) 9:55:00
- B) 10:05:40
- C) 10:07:05
- D) 10:12:40

12. How long would it take for the first *S*-wave to arrive at a seismic station 4,000 kilometers away from the epicenter of an earthquake?

- A) 5 min 40 sec
- B) 7 min 0 sec
- C) 12 min 40 sec
- D) 13 min 20 sec

Midterm Prep-Earthquakes

13. Base your answer to the following question on the cross-sectional view of Earth below, which shows seismic waves traveling from the focus of an earthquake. Points A and B are locations on Earth's surface.

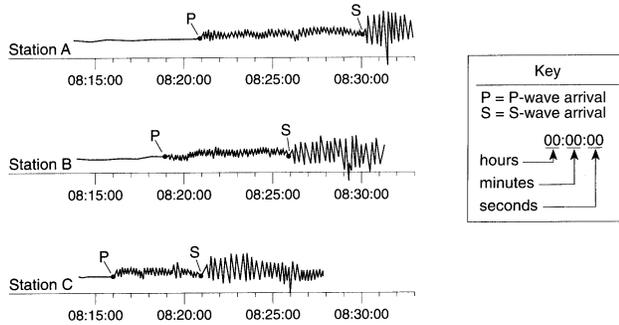


Which statement best explains why only one type of seismic wave was recorded at location *B*?

- A) *S*-waves cannot travel through the liquid outer core.
 - B) *S*-waves cannot travel through the liquid inner core.
 - C) *P*-waves cannot travel through the solid outer core.
 - D) *P*-waves cannot travel through the solid inner core.
-
14. A huge undersea earthquake off the Alaskan coastline could produce a
- A) tsunami
 - B) cyclone
 - C) hurricane
 - D) thunderstorm
15. The study of how seismic waves change as they travel through Earth has revealed that
- A) *P*-waves travel more slowly than *S*-waves through Earth's crust
 - B) seismic waves travel more slowly through the mantle because it is very dense
 - C) Earth's outer core is solid because *P*-waves are not transmitted through this layer
 - D) Earth's outer core is liquid because *S*-waves are not transmitted through this layer

Midterm Prep-Earthquakes

16. The diagram below represents three seismograms showing the same earthquake as it was recorded at three different seismic stations, *A*, *B*, and *C*.

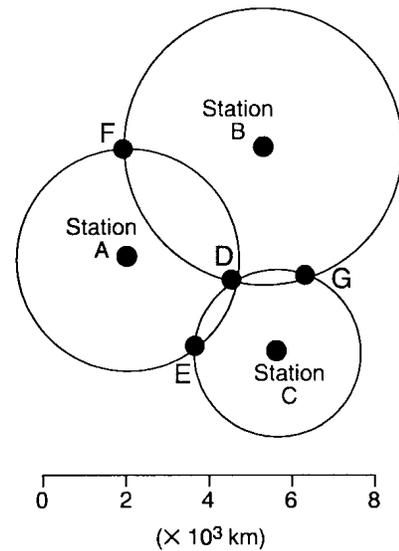


Which statement correctly describes the distance between the earthquake epicenter and these seismic stations?

- A) *A* is closest to the epicenter, and *C* is farthest from the epicenter.
 B) *B* is closest to the epicenter, and *C* is farthest from the epicenter.
 C) *C* is closest to the epicenter, and *A* is farthest from the epicenter.
 D) *A* is the closest to the epicenter, and *B* is the farthest from the epicenter.
17. An earthquake's *P*-wave arrived at a seismograph station at 02 hours 40 minutes 00 seconds. The earthquake's *S*-wave arrived at the same station 2 minutes later. What is the approximate distance from the seismograph station to the epicenter of the earthquake?

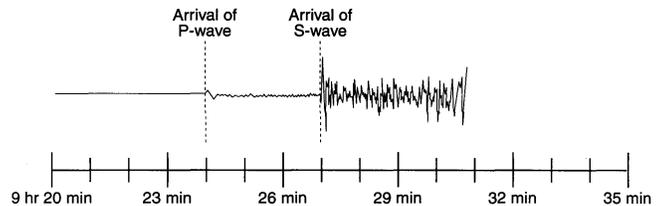
- A) 1,100 km B) 2,400 km
 C) 3,100 km D) 4,000 km

18. Base your answer to the following question on the diagram below, which represents seismic stations *A*, *B*, and *C*. The distance from each station to an earthquake's epicenter is plotted.



The epicenter is closest to point

- A) *D* B) *E* C) *F* D) *G*
19. The seismogram below shows the arrival times of an earthquake's *P*-wave and *S*-wave recorded at a seismic station in Portland, Oregon.



What was the distance from Portland to the earthquake's epicenter?

- A) 1800 km B) 2500 km
 C) 3200 km D) 4100 km
20. The epicenter of an earthquake is 6,000 kilometers from an observation point. What is the difference in travel time for the *P*-waves and *S*-waves?
- A) 7 min 35 sec B) 9 min 20 sec
 C) 13 min 10 sec D) 17 min 00 sec