TRAVEL TIME GRAPH REVIEW LAB

NAME _____/29

Tutorial video: https://www.youtube.com/watch?v=3eFS4WhsrHA

Seismic Wave Types:

Recall that there are three basic types of seismic waves: P-waves, S-waves, and Surface waves. P and S-waves are body waves and travel through the interior of the Earth. P-waves are fastest and reach the seismic station first. S-waves arrive at the seismic station after the P-waves. The amount of time that passes between the P-wave arrival and the S-wave arrival helps seismologists determine the epicenter of the earthquake. Review the information below:

FIGURE A

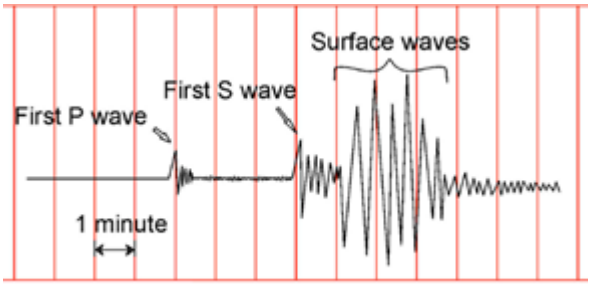
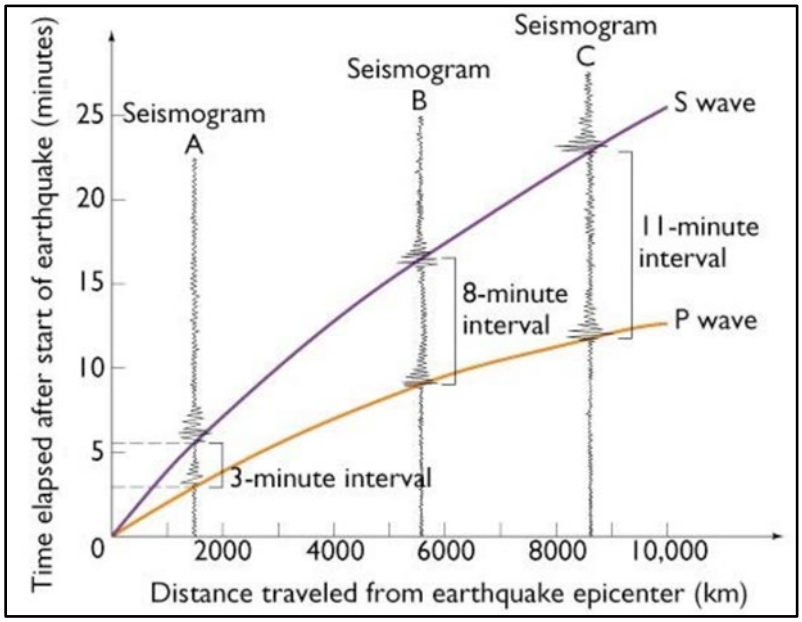


Figure 1. A typical seismogram

FIGURE B



1) Rank the seismic waves based on their destructiveness: (from most destructive to least destructive) [3 pts]

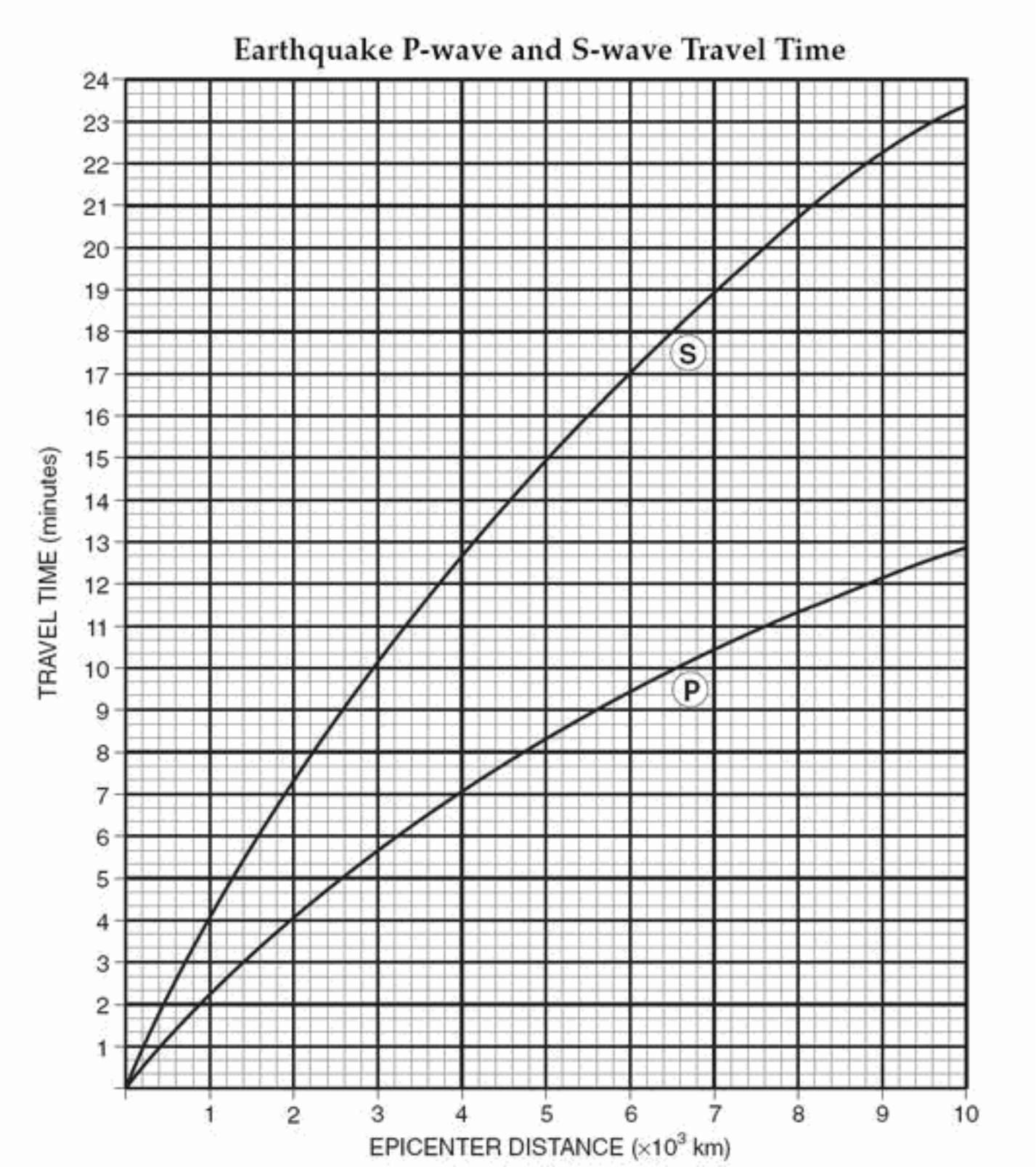
   1] _____
   2] _____
   3] _____

2) What is another term given for the 3-minute interval, 8-minute interval, and 11-minute interval?
   _____

3) Which seismograph came from a city that was farthest away? (A,B, OR C?) _____

4) The seismogram from the city that was the second farthest away had an 8-minute interval between what waves? _____ _____ (2 PTS)

5) The S wave is curved and not a straight diagonal. This means that
   a) The s wave slows down over time
   b) The s wave speeds up over time
   c) The s wave maintains a constant speed over time
   d) The s wave does not move over time



***Each box on the Y axis represents 20 seconds. Each box on the X axis represents 200 miles.**

6) P wave travel time is 5 minutes. How far did the seismic wave travel during this time period?

_____

7) How long does it take a P wave to travel 3000 kilometers? _____

8) How far does an S wave travel in 13 minutes and 40 seconds? _____

9) If an S wave travels 6000 km, how much time did it take? _____

10) If an earthquake's P wave travels 2000 kilometers and arrives at a seismic station at 1:00, what is the origin time of the earthquake? (when did the earthquake start?) _____

11) If an Earthquake's P wave travels 1000 kilometers and arrives at 1:00pm. When will the first S wave arrive? _____

12) The P wave has travelled 5000 km. What is the lag time for the S wave?

13) The first S-wave arrived at a seismograph station 11 minutes after an earthquake occurred. When did the first P-wave arrive? _____

Use a sticky note to do the "wedge method" on the following questions.

P arrival= 9:00 am S arrival=7 min and 20 seconds later

14) What is the lag time? _____

15) How far away is the epicenter? _____

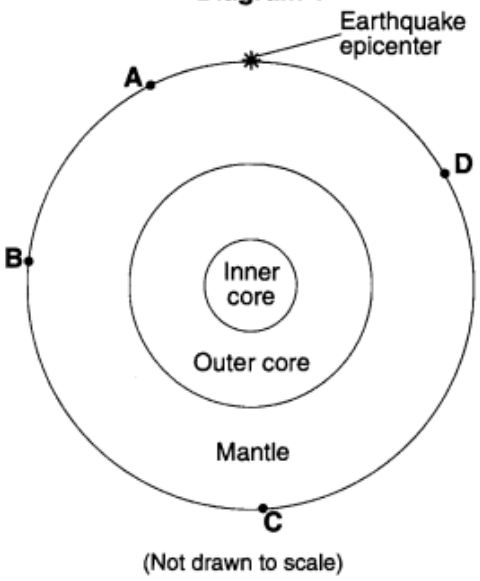
P arrival= 2:21pm S arrival=2:30:20 pm

16) What is the lag time? _____

17) How far away is the epicenter? _____

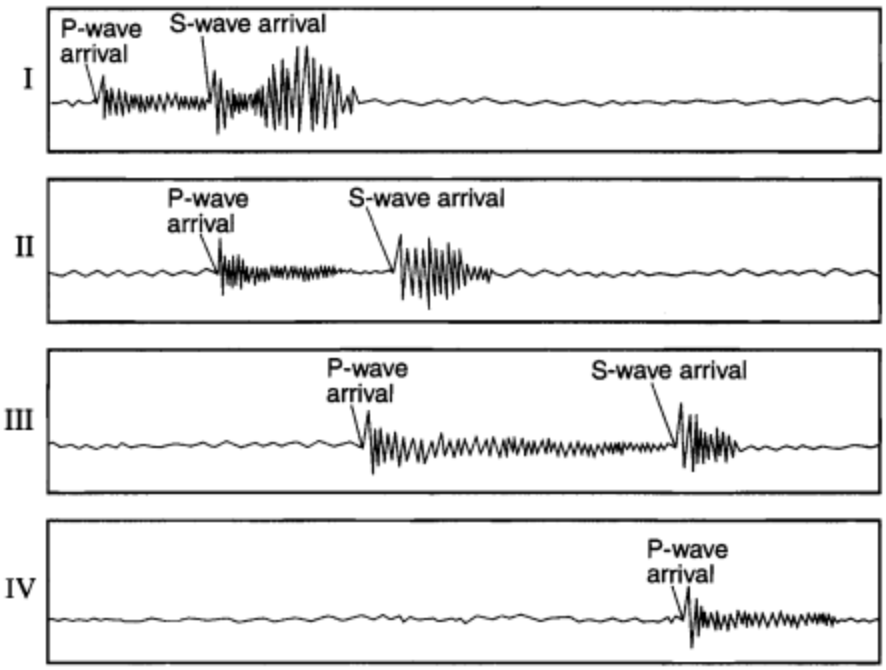
18) Lag time 3 minutes and 20 seconds. How far away was the earthquake? _____

Diagram 1



(Not drawn to scale)

Diagram 2



19) 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?

20) Match the seismograms in diagram 2 to the stations in diagram 1. The stations are marked A, B, C, D.

seismogram I - station _____

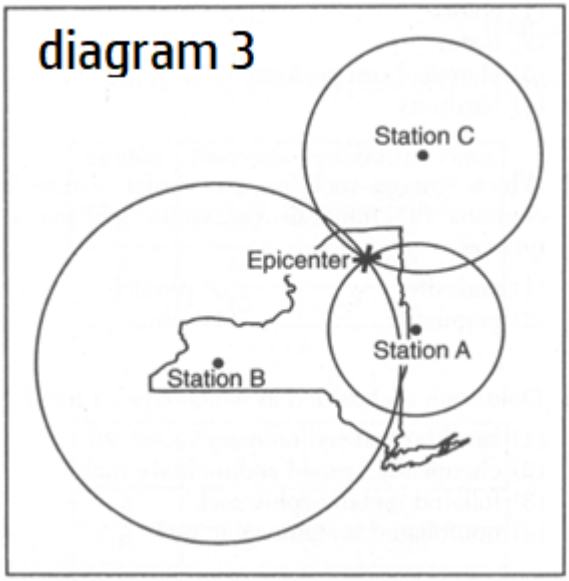
seismogram II - station _____

seismogram III - station _____

seismogram IV - station _____

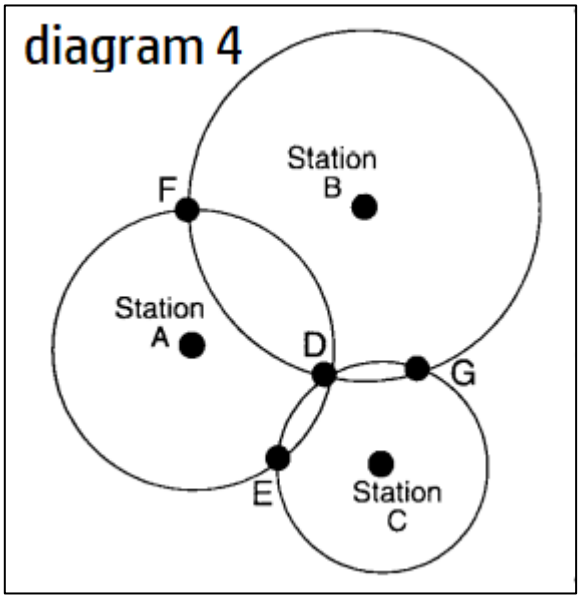
21) Look at diagram 3. The seismogram from station A would show _____.

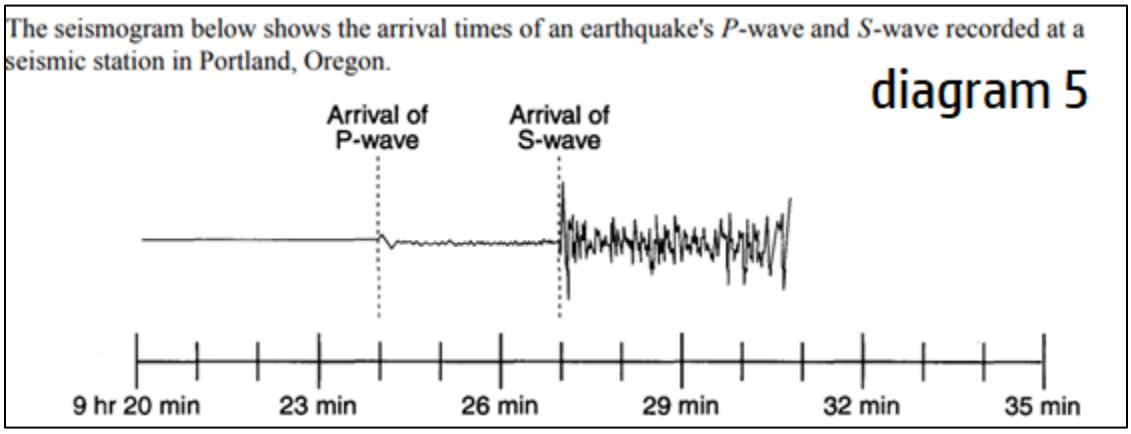
A) arrival of P-waves, only
B) earliest arrival time of P-waves
C) greatest difference in the arrival times of P-waves and S-waves
D) arrival of S-waves before the arrival of P-waves T



22) Look at diagram 4. The epicenter is closest to point

a) F
b) D
c) G
d) E





23) Look at diagram 5. What was the distance from Portland to the earthquake's epicenter?

A) 1800 km
B) 2500 km
C) 3200 km
D) 4100 km