

Seismic Waves

Name & Set

1 (a) What is an earthquake and what causes it?

[3]

(b) Some regions of Earth are more prone to earthquakes than others. Explain why.

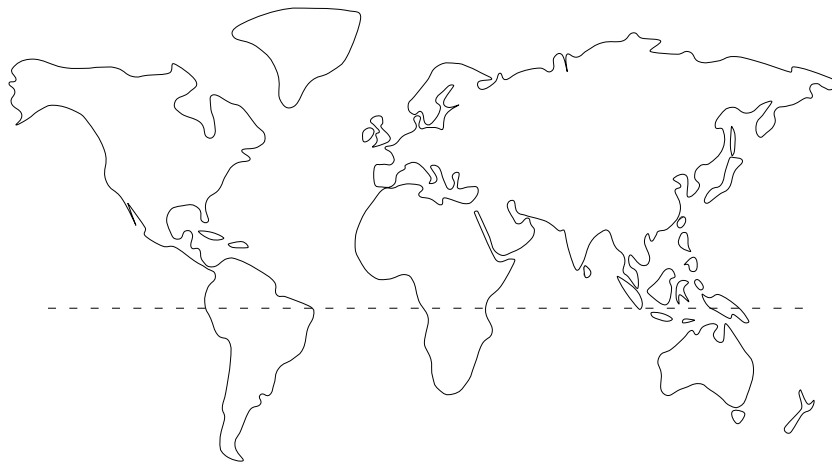
[3]

(c) Name **three** such regions and mark them on the map below.

A. _____ [1]

B. _____ [1]

C. _____ [1]



(d) Is there similar geological activity on other planets? Give examples.

[3]

2 (a) What are seismic waves?

[2]

(b) What causes seismic waves?

[1]

(c) How many types of seismic waves are there? Name them.

[2]

(d) Give *two* important properties for each type of seismic wave.

(i) _____
_____ [2]

(ii) _____
_____ [2]

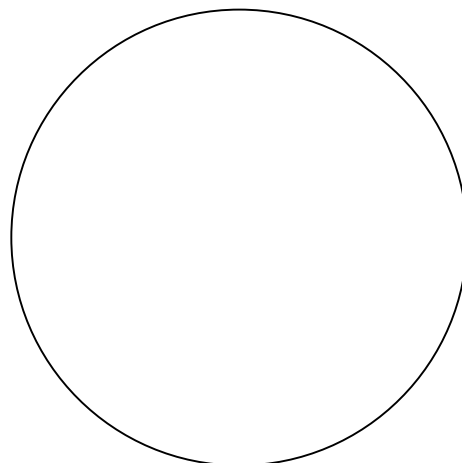
(e) What do geophysicists conclude about the internal structure of the Earth by studying seismic waves?

[2]

(d) What evidence is there that part of the Earth's core is liquid?

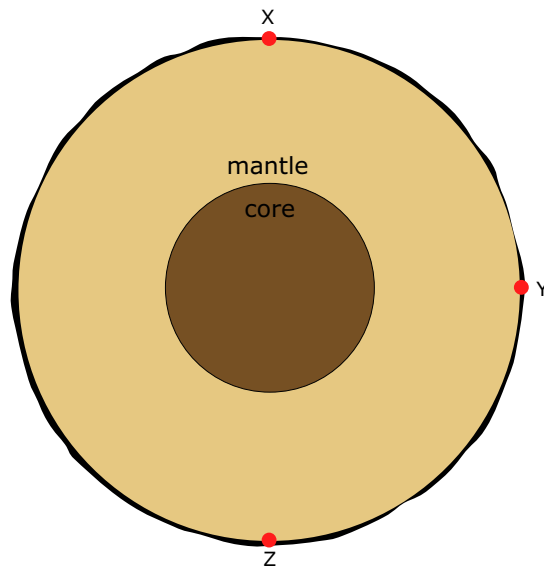
[3]

(e) Draw a labelled diagram of the Earth's internal structure below. [4]



3 The diagram below shows a cross section of the Earth. An earthquake occurs at X. Some while later, seismic waves are detected at Y. The waves reaching Y are a mixture of longitudinal and transverse waves. The longitudinal waves arrive before the transverse ones.

(a) Add to the diagram below the path taken by the seismic waves that reach Y from X.



(b) Explain the shape of the path taken by the waves in terms of the density of the mantle and the speed of waves through a solid.

[3]

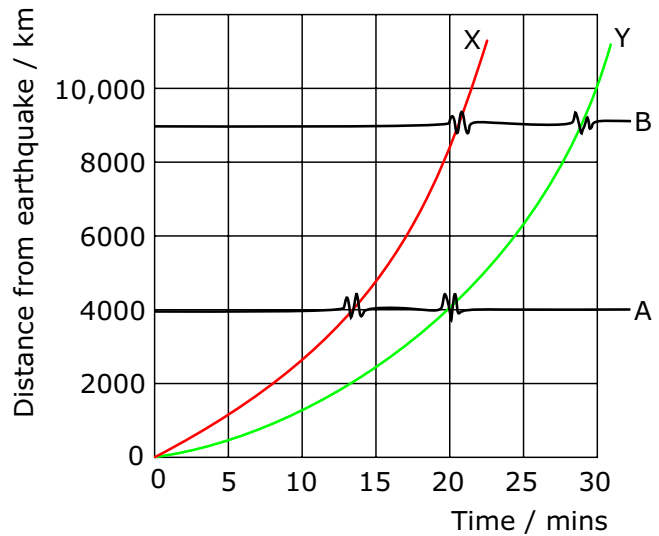
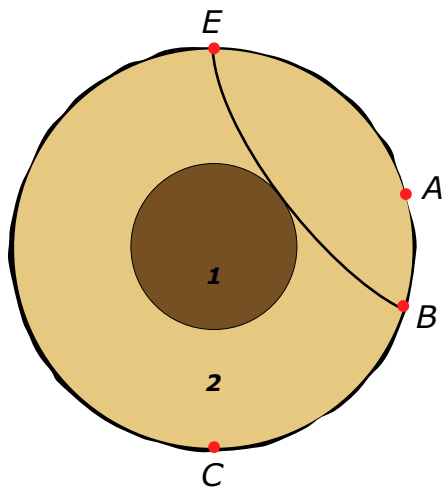
(c) Will any seismic waves be detected at Z? Explain your answer fully.

[2]

(d) What can be deduced about the core by comparing the seismic records at Y with those at Z?

[2]

- 4 Seismic waves from an earthquake at E are detected by seismic stations A & B. The passage of seismic waves X and Y through the Earth is plotted on a distance/time graph.



- (a) On the cross-section of the Earth:
- (i) draw the path taken by seismic waves between E and A. [1]
 - (ii) Label the regions 1 & 2. [2]
 - (iii) What type of wave is X? _____ [1]
 - (iv) What type of wave is Y? _____ [1]
 - (v) Why are there two traces at each station? _____

_____ [3]

- (b) Use the graph to calculate the average speed of seismic wave X as it travels from the centre of the earthquake to seismic station A and B.

(i) Speed of seismic wave X between E and A _____ [1]

(ii) Speed of seismic wave X between E and B _____ [1]

- (iii) Use your answers to b(i) and b (ii) to explain the path of the seismic wave between E and the seismic stations.

_____ [2]

- (iv) What would the seismic record look like at between B & C? Explain your answer.

_____ [3]

Speed of seismic wave Y between E and A _____

_____ [1]

Explain why the average speed in (i) is not the same as in (ii)

_____ [1]