

Plate Tectonics PowerPoint Questions

Base your answers to questions 74 through 77 on the information below and on your knowledge of Earth science.

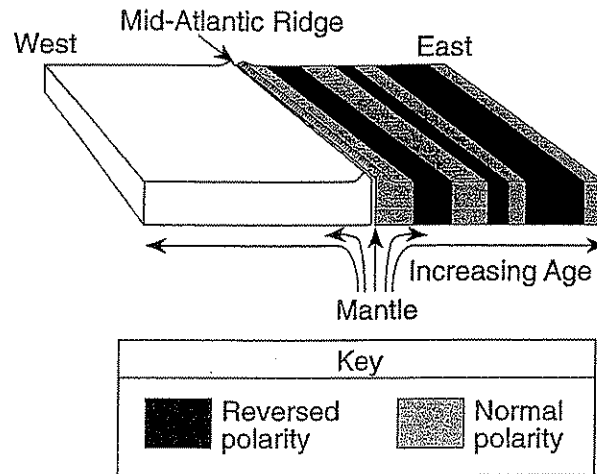
In the 1930s, most scientists believed that Earth's crust and interior were solid and motionless. A small group of scientists were talking about "continental drift," which is the idea that Earth's crust is not stationary, but is constantly shifting and moving.

From seismic data, geophysical evidence, and laboratory experiments, scientists now generally agree that lithospheric plates move at the surface. Both Earth's surface and interior are in motion. Solid rock in the mantle can be softened and shaped when subjected to the heat and pressure within Earth's interior over millions of years.

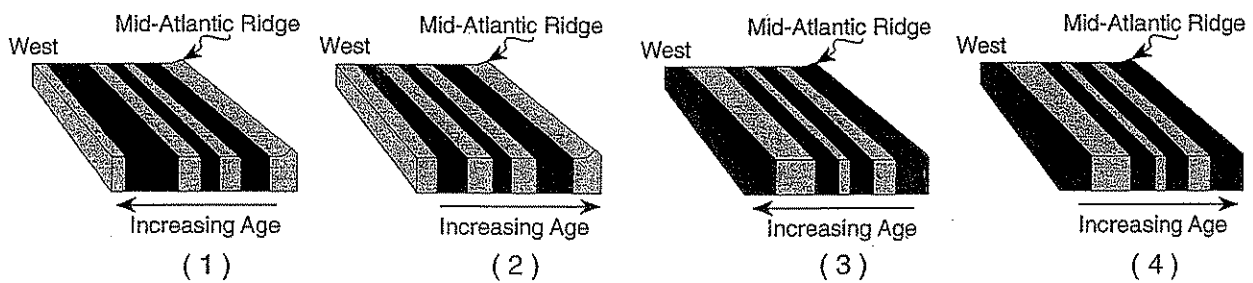
Subduction processes are believed by many scientists to be the driving force of plate tectonics. At present, this theory cannot be directly observed and confirmed. The lithospheric plates have moved in the past and are still moving today. The details of why and how they move will continue to challenge scientists.

- 74 Earth's crust is described as "constantly shifting and moving." Give one example of geologic evidence that supports the conclusion that continents have drifted apart. [1]
- 75 The information given suggests that "subduction processes are the driving force of plate tectonics." Identify a specific location of a subduction zone on Earth. [1]
- 76 According to the *Earth Science Reference Tables*, at what inferred depth is mantle rock partially melted and slowly moving below the lithospheric plates? [1]
- 77 According to the geologic record, during which geologic time period did the lithospheric plates that made up Pangea begin to break up? [1]
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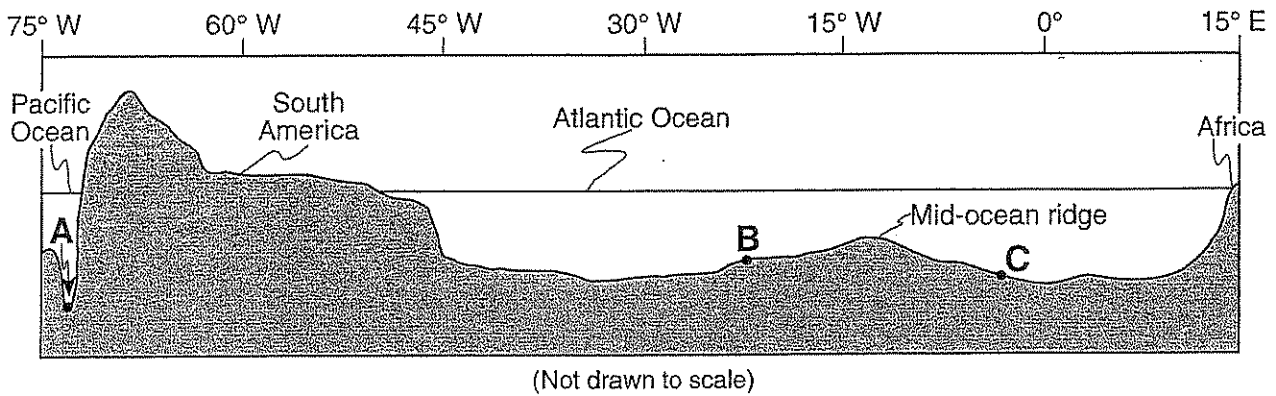
28 The diagram below represents the pattern of normal and reversed magnetic polarity and the relative age of the igneous bedrock composing the ocean floor on the east side of the Mid-Atlantic Ridge. The magnetic polarity of the bedrock on the west side of the ridge has been deliberately left blank.



Which diagram best shows the magnetic pattern and relative age of the igneous bedrock on the west side of the ridge?



Base your answers to questions 67 through 69 on the cross section below, which shows the major surface features of Earth along 25° S latitude between 75° W and 15° E longitude. Points A, B, and C represent locations on Earth's crust.

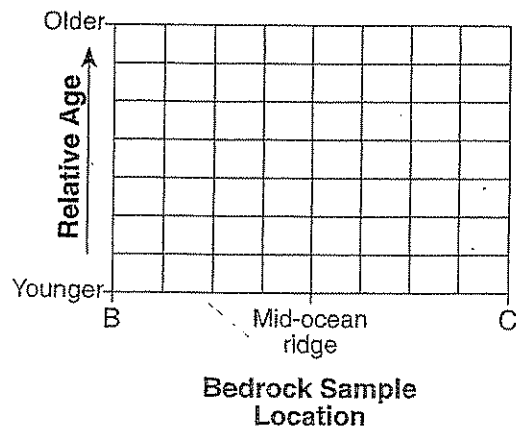


- 67 Identify the crustal feature located at point A. [1]
- 68 Identify the tectonic plate motion that is causing an increase in the distance between South America and Africa. [1]
- 69 Bedrock samples were taken at the mid-ocean ridge and points B and C. On the grid in your answer booklet, draw a line to show the relative age of the bedrock samples between these locations. [1]

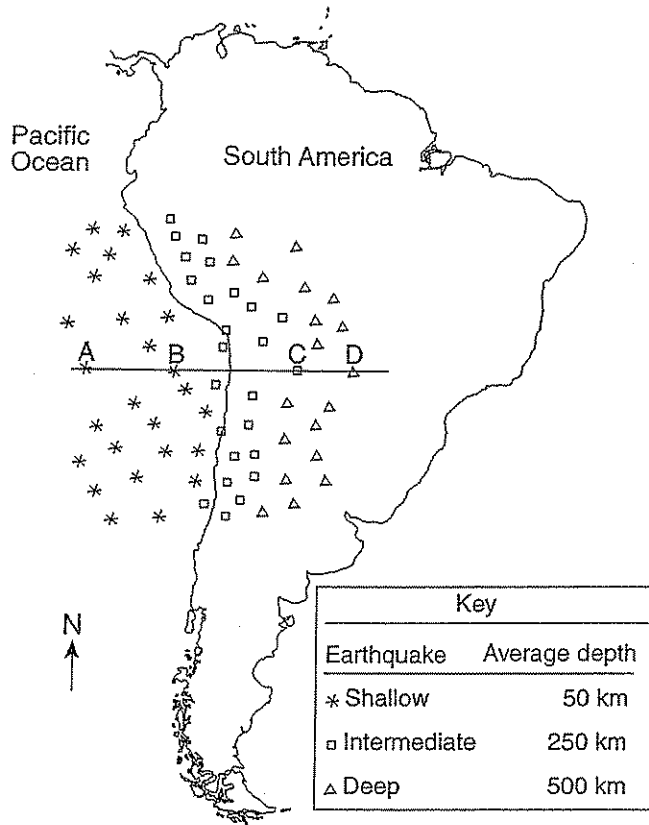
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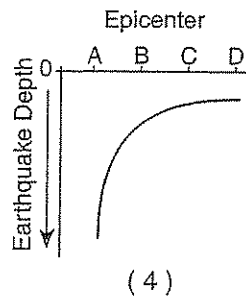
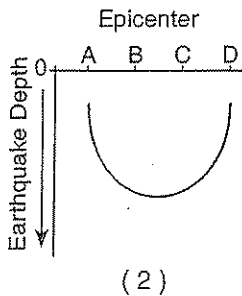
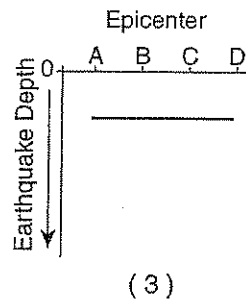
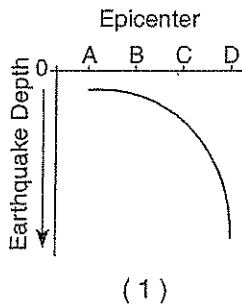
69



Base your answers to questions 49 and 50 on the map below, which shows the depths of selected earthquakes along the crustal plate boundary near the west coast of South America. Letters A, B, C, and D are epicenter locations along a west-to-east line at the surface. The relative depth of each earthquake is indicated.



49 Which graph best shows the depth of earthquakes beneath epicenters A, B, C, and D?



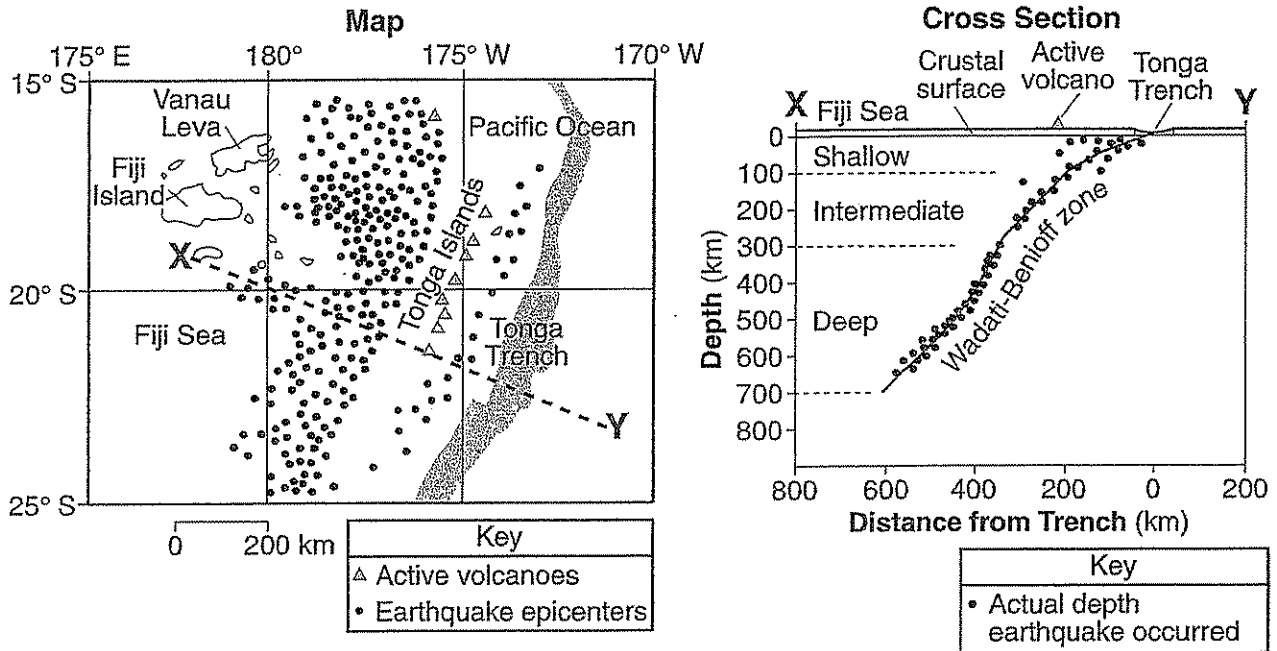
50 The earthquake beneath epicenter D occurred in which part of Earth's interior?

- (1) crust
- (2) rigid mantle
- (3) asthenosphere
- (4) stiffer mantle

Base your answers to questions 47 through 50 on the information, map, and cross section below.

The map represents a portion of Earth's surface in the Pacific Ocean. The positions of islands, earthquake epicenters, active volcanoes, and the Tonga Trench are shown. Lines of latitude and longitude have been included.

The cross section shows earthquakes that occurred beneath line XY on the map. Depth beneath Earth's surface is indicated by the scale along the left side of the cross section, as are the range of depths for shallow, intermediate, and deep earthquakes. Distance from the trench is indicated by the scale along the bottom of the cross section.



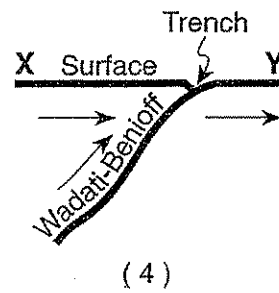
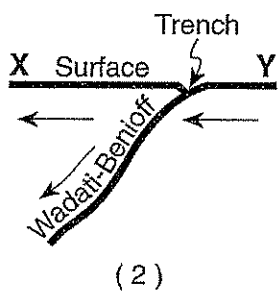
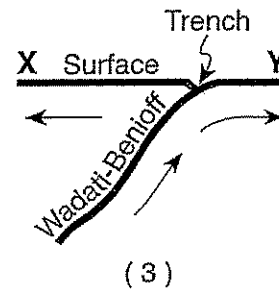
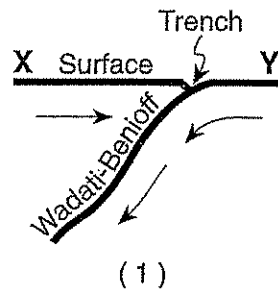
47 The Tonga Trench is located at the tectonic boundary between the Pacific Plate and the

- (1) Antarctic Plate
- (2) Philippine Plate
- (3) Indian-Australian Plate
- (4) Nazca Plate

48 The greatest number of earthquakes shown in the cross section occurred

- (1) at sea level
- (2) between sea level and a depth of 100 km
- (3) at a depth between 100 and 300 km
- (4) at a depth between 300 and 600 km

49 Which cross section has arrows that best represent the relative motion of the crustal plates along the Wadati-Benioff zone beneath the Tonga Trench?



50 The latitude and longitude of the center of Vanau Leva is closest to

- (1) 17° N 179° W
- (2) 17° N 181° W

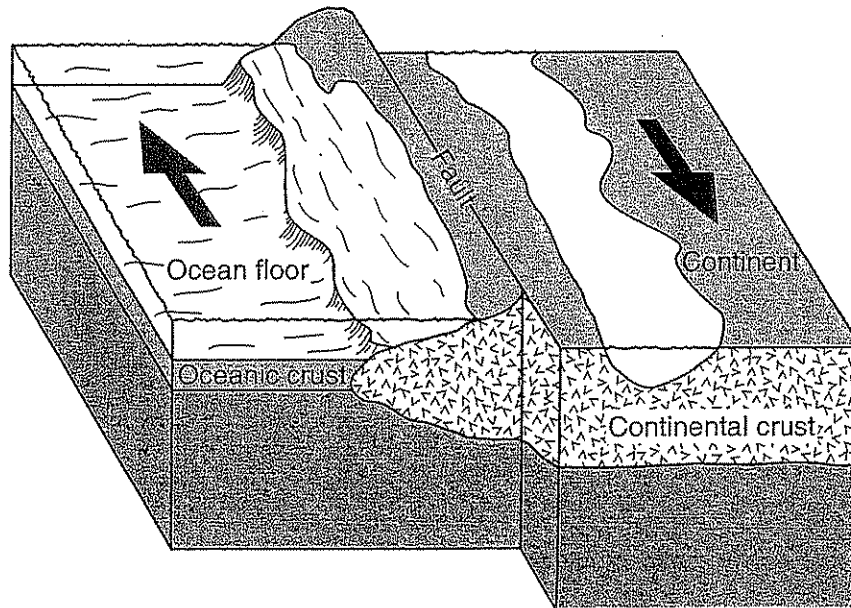
- (3) 17° S 179° E
- (4) 17° S 181° E

- 987) Tectonic plate boundaries may be classified as divergent, convergent, or transform. For each location listed in the data table below, place an X in the proper column to indicate the type of plate boundary at that location.

Plate Boundaries DATA TABLE

Location	Type of Plate Boundary		
	Divergent	Convergent	Transform
East Pacific Ridge			
Aleutian Trench			
West side of the South American Plate			
San Andreas Fault			

- 32 Arrows in the block diagram below show the relative movement along a tectonic plate boundary.

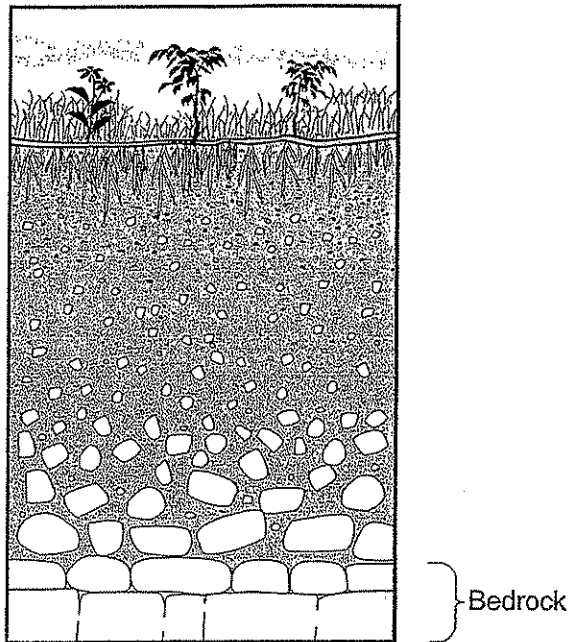


(Not drawn to scale)

Between which two tectonic plates does this type of plate boundary exist?

- (1) Nazca Plate and South American Plate
- (2) Eurasian Plate and Indian-Australian Plate
- (3) North American Plate and Eurasian Plate
- (4) Pacific Plate and North American Plate

17 The cross section below shows a soil profile.



This soil was formed primarily by

- (1) erosion by glaciers
- (2) erosion by running water
- (3) capillarity and human activity
- (4) weathering and biological activity

18 Which type of rock most likely contains fossils?

- | | |
|------------|------------|
| (1) scoria | (3) schist |
| (2) gabbro | (4) shale |

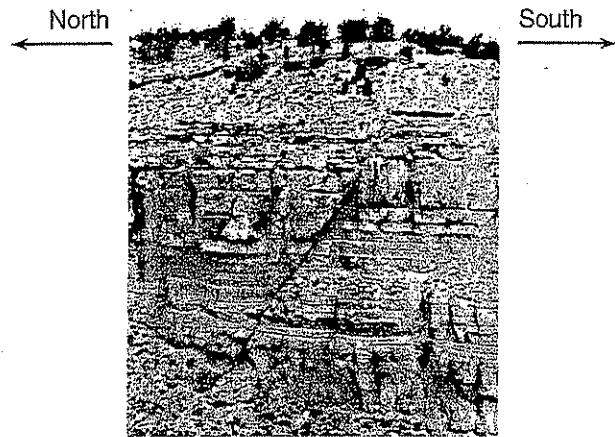
19 In which New York State landscape region is most of the surface bedrock composed of metamorphic rock?

- (1) Adirondacks
- (2) Catskills
- (3) Erie-Ontario Lowlands
- (4) Newark Lowlands

20 A human fingernail has a hardness of approximately 2.5. Which two minerals are *softer* than a human fingernail?

- (1) calcite and halite
- (2) sulfur and fluorite
- (3) graphite and talc
- (4) pyrite and magnetite

21 The photograph below shows an escarpment (cliff) located in the western United States. The directions for north and south are indicated by arrows. A fault in the sedimentary rocks is shown on the front of the escarpment.



The photograph shows that the fault most likely formed

- (1) after the rock layers were deposited, when the north side moved downward
- (2) after the rock layers were deposited, when the north side moved upward
- (3) before the rock layers were deposited, when the south side moved downward
- (4) before the rock layers were deposited, when the south side moved upward

22 Which mountain range resulted from the collision of North America and Africa, as parts of Pangea joined together in the late Pennsylvanian Period?

- (1) Appalachian Mountains
- (2) Acadian Mountains
- (3) Taconic Mountains
- (4) Grenville Mountains

23 Which physical characteristic best describes the rock phyllite?

- (1) glassy texture with gas pockets
- (2) clastic texture with angular fragments
- (3) bioclastic texture with cemented shell fragments
- (4) foliated texture with microscopic mica crystals

1026) The diagram below shows a fossil found in the surface bedrock of New York State.

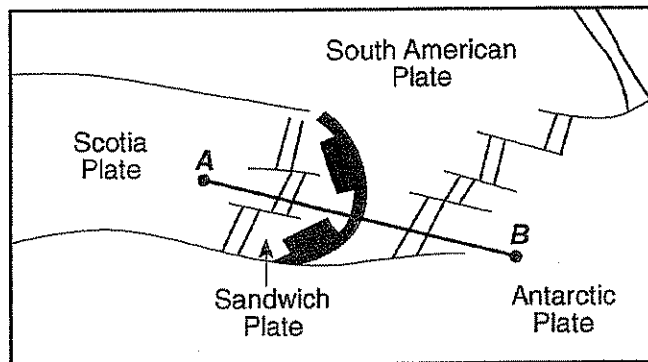


Centroceras

Which other fossil is most likely to be found in the same age bedrock?

- A) *Phacops*
- B) condor
- C) *Coelophysis*
- D) *Tetragraptus*

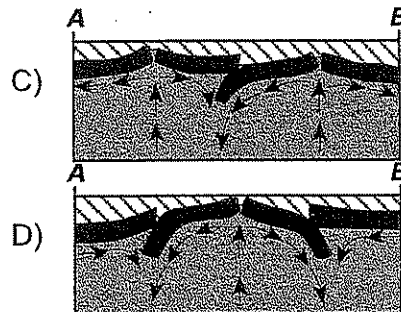
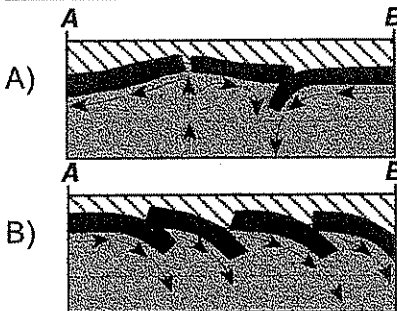
1027) On the map below, line AB is drawn across several of Earth's tectonic plates in the South Atlantic Ocean.



Which cross section best represents the plate boundaries and mantle movement beneath line AB?

KEY:

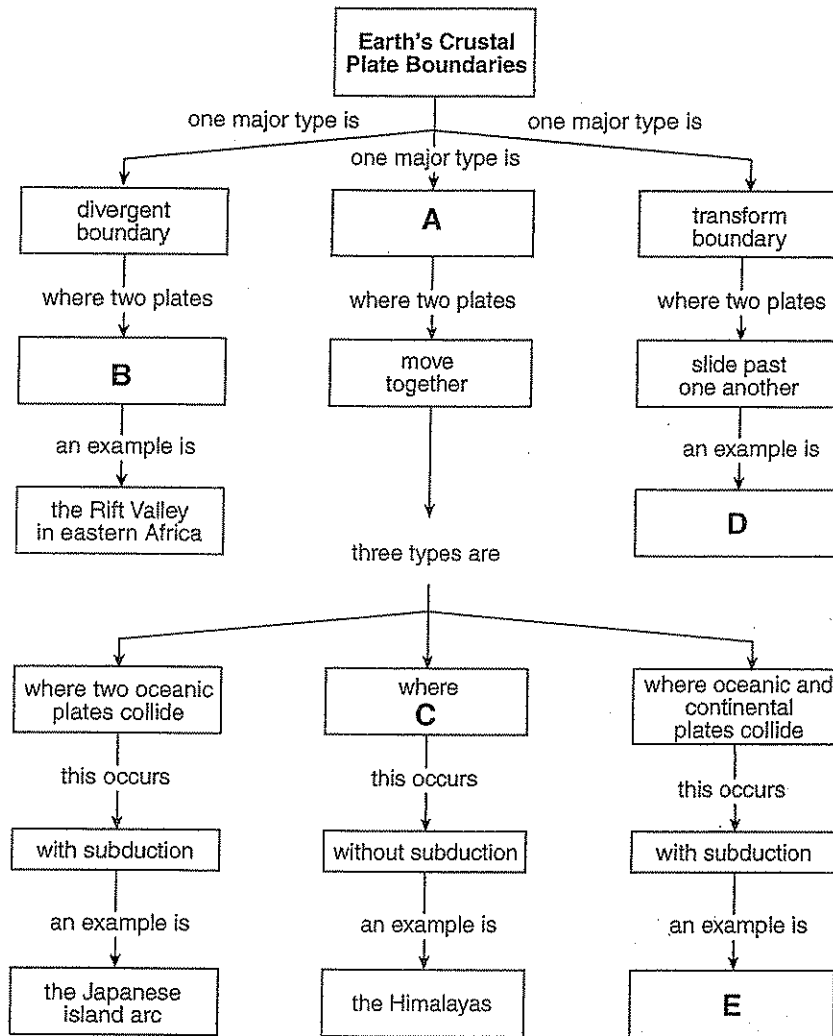
	Ocean		Lithosphere		Mantle
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1028) The Canaries Current along the west coast of Africa and the Peru Current along the west coast of South America are both

- A) cool currents that flow away from the Equator
- B) cool currents that flow toward the Equator
- C) warm currents that flow toward the Equator
- D) warm currents that flow away from the Equator

Base your answers to questions 59 and 60 on the diagram below, which shows an incomplete concept map identifying the types of plate boundaries. Information in the boxes labeled *A*, *B*, *C*, *D*, and *E* has been deliberately omitted.



59 On the chart provided *in your answer booklet*, write the information that should be placed in the boxes labeled *A*, *B*, and *C* that will correctly complete those portions of the concept map. [2]

60 On the geographic map provided *in your answer booklet*, write the letters *D* and *E* on the plate boundary locations where the indicated movements are occurring. Write the letters approximately the same size as shown on the concept map and locate the letters directly on the plate boundary. [2]

Questions 963 through 965 refer to the following:

The map below shows the location of the Peru-Chile Trench.



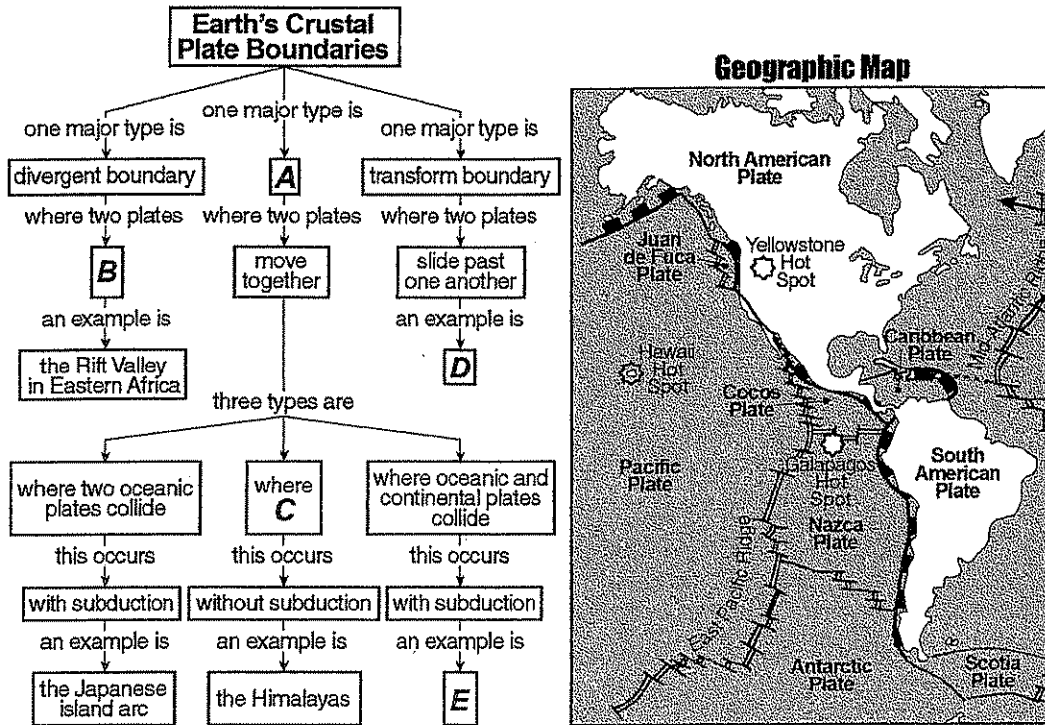
- 963) The Peru-Chile Trench marks the boundary between the
- Caribbean Plate and the Scotia Plate
 - Nazca Plate and the South American Plate
 - North American Plate and the Cocos Plate
 - Pacific Plate and the Antarctic Plate
- 964) In which diagram do the arrows *best* represent the motions of Earth's crust at the Peru-Chile Trench?



- 965) Which observation provides the *best* evidence of the pattern of crustal movement at the Peru-Chile Trench?
- the direction of flow of warm ocean currents
 - comparison of the rates of sediment deposition
 - the locations of shallow-focus and deep-focus earthquakes
 - the mineral composition of samples of mafic mantle rock

Questions 256 and 257 refer to the following:

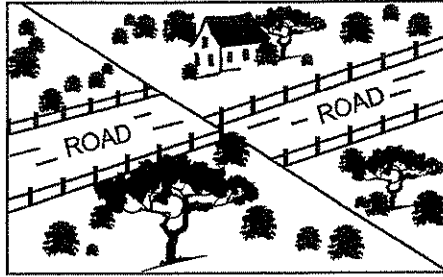
The diagram below shows an incomplete concept map identifying the types of plate boundaries. Information in the boxes labeled A, B, C, D, and E has been deliberately omitted.



- 256) On the given geographic map, write the letters *D* and *E* on the plate boundary locations where the indicated movements are occurring. Write the letters approximately the same size as shown on the concept map and locate the letters directly on the plate boundary.
- 257) On the chart below, write the information that should be placed in the boxes labeled *A*, *B*, and *C* that will correctly complete those portions of the concept map shown.

Letter	Information That Should be Placed in Each Box
A	
B	
C	

587) The diagram below shows land features that have been disrupted by an earthquake.

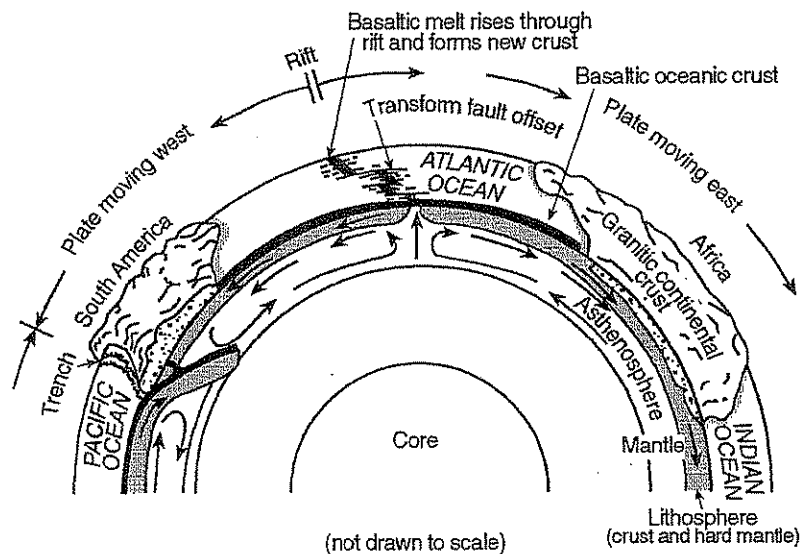


Which type of crustal movement most likely caused the displacement of features in this area?

- A) vertical lifting of surface rock C) down-warping of the crust
 B) folding of surface rock D) movement along a transform fault

Questions 588 through 590 refer to the following:

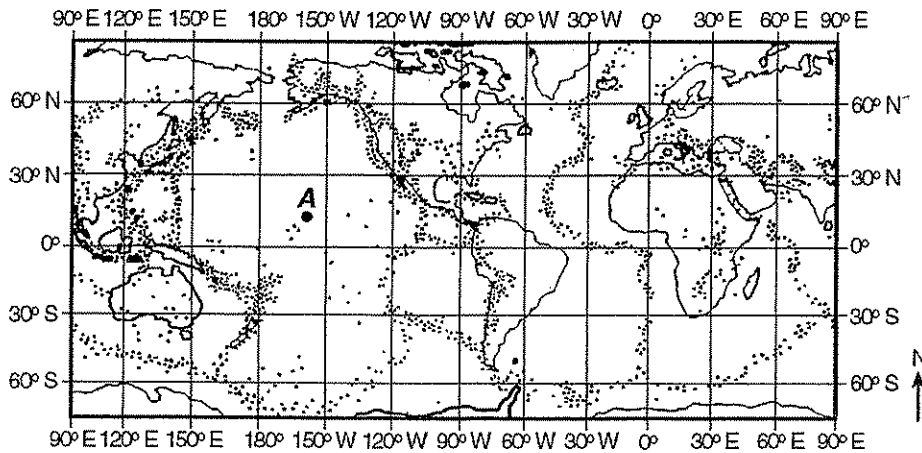
The diagram below shows a model of the relationship between Earth's surface and its interior.



- 588) According to the diagram, the deep trench along the west coast of South America is caused by movement of the oceanic crust that is
- A) uplifting over the continental crust
 B) colliding with the Atlantic oceanic crust
 C) sinking at the Mid-Atlantic ridge
 D) sinking beneath the continental crust
- 589) The motion of the convection currents in the mantle beneath the Atlantic Ocean appears to be mainly making this ocean basin
- A) wider B) narrower C) shallower D) deeper
- 590) Mid-ocean ridges (rifts) normally form where tectonic plates are
- A) sliding past each other C) diverging
 B) converging D) stationary

Questions 886 and 887 refer to the following:

The dots on the map below show the distribution of major earthquake epicenters. The shaded circle labeled A represents a location on Earth's surface.



- 886) Location A in the given diagram is *best* described as an area that is
- within a rift valley at a mid-ocean ridge
 - above a mantle hot spot near the center of a crustal plate
 - within a deep-sea trench between two converging plates
 - at the boundary between two diverging plates
- 887) Which one of the following conclusions can *best* be inferred from the data shown on the given map?
- Most earthquakes occur west of the Prime Meridian and north of the Equator.
 - Most earthquakes are concentrated in zones along plate boundaries.
 - Earthquakes generally are evenly distributed over the surface of Earth.
 - Most earthquakes occur on continents.
- 888) Which element is *most* abundant in Earth's lithosphere?
- oxygen
 - hydrogen
 - nitrogen
 - silicon
- 889) The large coal fields found in Pennsylvania provide evidence that the climate of the northeastern United States was much warmer during the Carboniferous Period. This change in climate over time is *best* explained by the
- evolution of life
 - effects of seasons
 - movements of tectonic plates
 - changes in the environment caused by humans