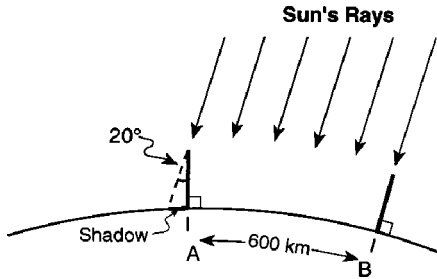


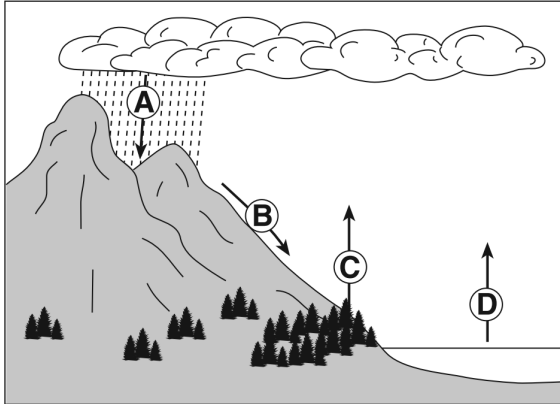
NY Regents Earth Science Samples

1. Locations *A* and *B* are 600 kilometers apart on the equator of a planet's spherical moon. When the Sun is directly over point *B*, a shadow is cast by a pole at point *A* as shown below.



According to Eratosthenes' method, the circumference of the moon would be calculated as

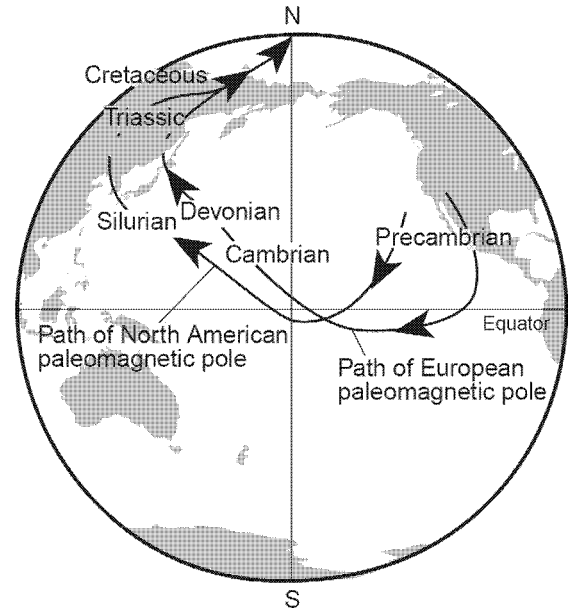
- A. 2400 km B. 3300 km
 C. 5400 km D. 10800 km
2. The arrows in the diagram below represent the movement of water in the water cycle.



Which arrow represents the process of transpiration?

- A. *A* B. *B* C. *C* D. *D*

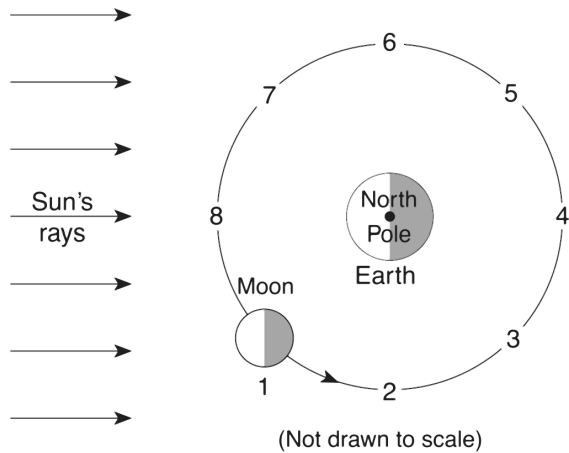
3. The arrows on the accompanying map show the apparent changes in the position of Earth's magnetic North Pole throughout geologic time, as recorded in the igneous rocks of Europe and North America.



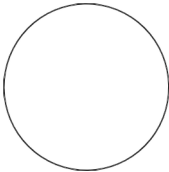
This evidence best supports the concept of

- A. the heliocentric solar system
 B. the Coriolis effect
 C. planet orbit eccentricity
 D. plate tectonics
4. An object's weight at sea level at 90° North latitude is slightly more than the weight of the same object at sea level at 0° latitude. Which statement about Earth can best be inferred from this evidence?
- A. Earth's orbit is slightly elliptical.
 B. Earth's axis is tilted 23½° to the plane of its orbit.
 C. Earth's shape is slightly bulged at the Equator.
 D. Earth rotates counterclockwise as viewed from above the Equator.

5. Base your answers to the following questions on the diagram below, which shows the Moon at position 1 in its orbit around Earth. Numbers 2 through 8 represent other positions in the Moon's orbit.



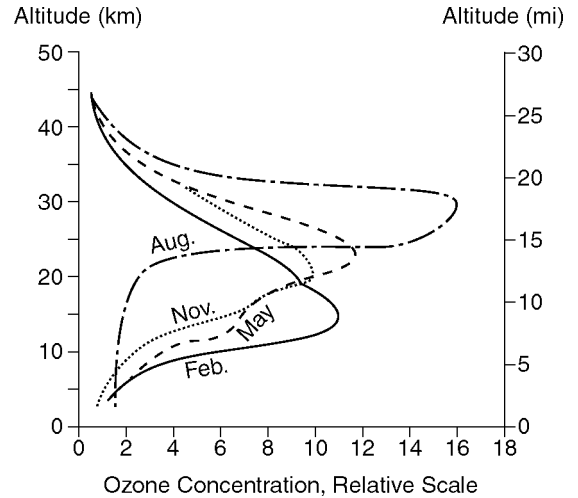
On the diagram below, shade the portion of the Moon that is in darkness as viewed from New York State when the Moon is at position 1.



6. A solar eclipse could occur when the Moon is located at which numbered position?
7. Identify *one* numbered orbital position where the gravitational attraction of the Moon and the Sun cause Earth to experience the highest high tides.
8. Earth's hydrosphere is best described as the
- solid outer layer of Earth
 - liquid outer layer of Earth
 - magma layer located below Earth's stiffer mantle
 - gaseous layer extending several hundred kilometers from Earth into space

9. Base your answer(s) to the following question(s) on the 2001 edition of the Earth Science Reference Tables and on your knowledge of Earth science.

The accompanying graph shows the average concentration of ozone in Earth's atmosphere over Arizona during 4 months of the year.



Which layer of Earth's atmosphere contains the greatest concentration of ozone?

- troposphere
 - stratosphere
 - mesosphere
 - thermosphere
10. From the top of the stiffer mantle to the center of Earth, the rock material is inferred to be
- solid all the way to the center of the inner core
 - solid, then liquid to the center of the inner core
 - solid, then liquid, then solid again to the center of the inner core
 - solid, then liquid, then gaseous to the center of the inner core

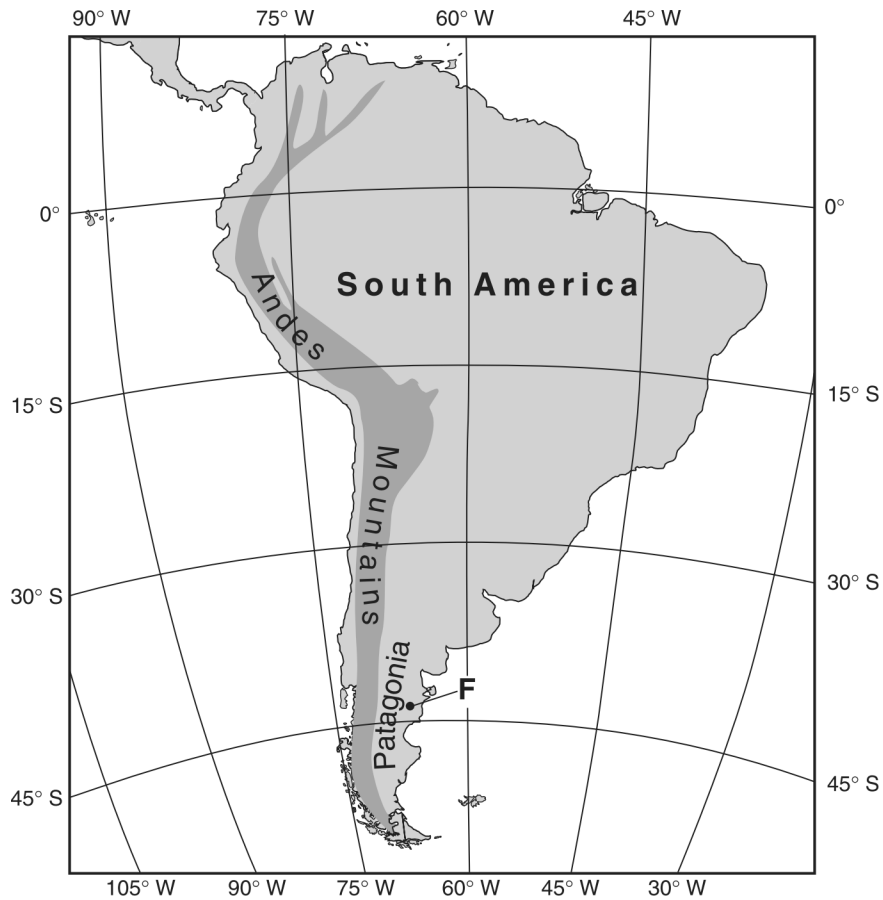
Base your answers to the following questions on the passage and map below. Point *F* on the map shows the location where an unusual mammal fossil was found.

Fossil Jaw of Mammal Found in South America

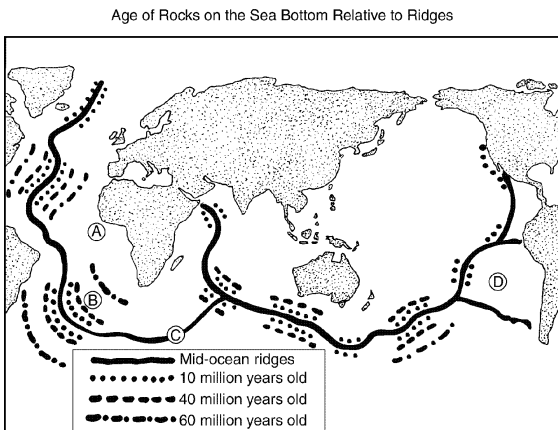
Paleontologists working in Patagonia have found the tiny fossil jaw that may be the first evidence of early mammals in South America.

The fossil, which measures less than a quarter-inch long, is believed to be from the middle or late Jurassic Period. Researchers said it suggests that mammals developed independently in the Southern Hemisphere.

The fossil, named *Asfaltomylos patagonicus*, was discovered in a shale formation in Patagonia. Dinosaurs were the dominant land animal at that time. Mammals were tiny, and hunted insects in the dense tropical vegetation. The now-arid region also has yielded some remarkable dinosaur fossils from the same period in a vast ancient boneyard covering hundreds of square miles.



11. What other life-form first appeared on Earth during the geologic period when *Asfaltomylos patagonicus* existed?
12. State *one* method used by geologists to determine the age of the bedrock in which this ancient mammal fossil was found.
13. Base your answer(s) to the following question(s) on the map, which shows the location of mid-ocean ridges and the age of some oceanic bedrock near these ridges. Letters A through D are locations on the surface of the ocean floor.

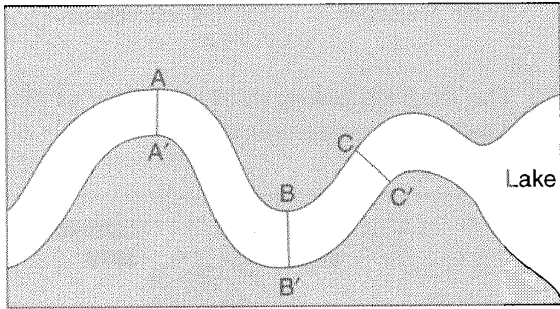


What is the most probable age, in millions of years, of the bedrock at location B?

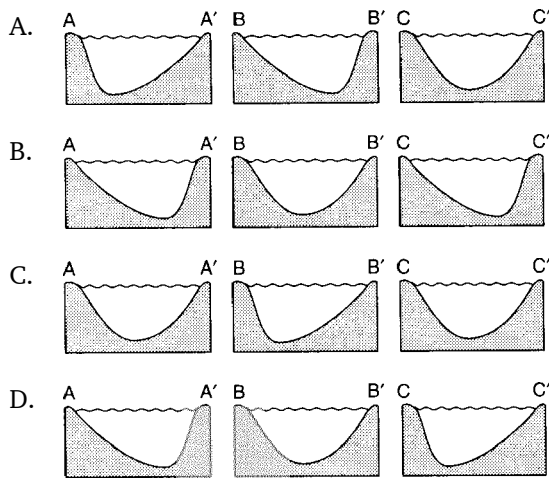
- A. 5 B. 12 C. 48 D. 62
14. The age of oceanic bedrock on either side of a mid-ocean ridge is supporting evidence that at the ridges, tectonic plates are
 - A. diverging
 - B. converging
 - C. locked in place
 - D. being subducted

15. The end product of the weathering of gabbro or basalt rocks is a solution of dissolved material that most likely would contain high amounts of
 - A. iron and magnesium
 - B. magnesium and potassium
 - C. aluminum and iron
 - D. aluminum and potassium
16. Which set of surface soil conditions on a hillside would result in the most infiltration of rainfall?
 - A. gentle slope, saturated soil, no vegetation
 - B. gentle slope, unsaturated soil, vegetation
 - C. steep slope, saturated soil, vegetation
 - D. steep slope, unsaturated soil, no vegetation
17. Why is the surface of Mercury covered with meteor impact craters, while Earth's surface has relatively few craters?
 - A. Mercury is larger than Earth, so it gets hit with more meteors.
 - B. Mercury is an older planet, so it has a longer history of meteor impacts.
 - C. Earth's less dense water surface attracts fewer meteors.
 - D. Earth's hydrosphere and atmosphere destroyed or buried most meteor impact sites.

18. The accompanying map represents a meandering stream following a lake. A student measured water depths in the stream at three locations: A-A', B-B', and C-C'.

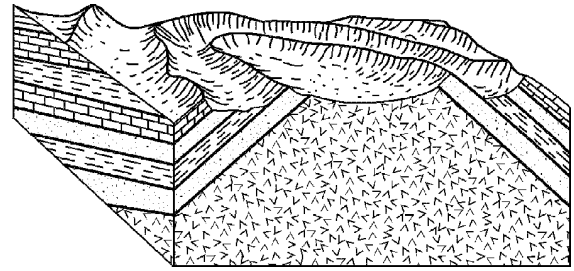


Which set of cross sections best represents the streambed at the three locations?

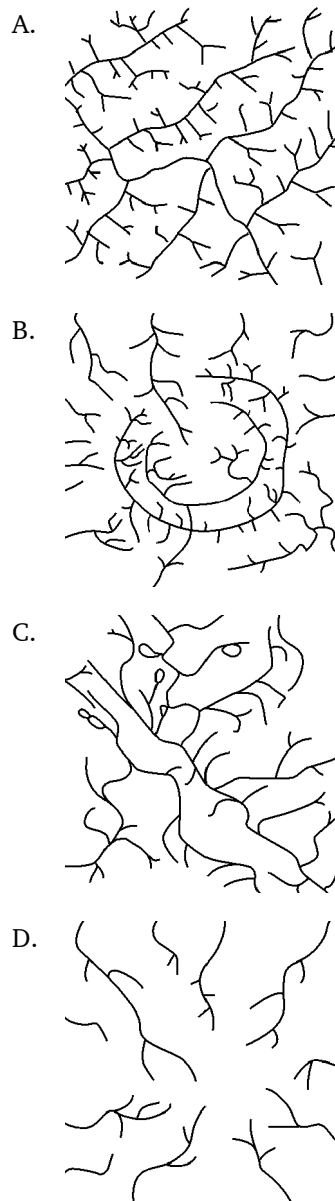


19. Which statement provides the best evidence that New York State's Finger Lakes formed as a result of continental glaciation?
- The lake surfaces are above sea level.
 - The lakes fill long, narrow U-shaped valleys.
 - The lakes are partially filled with sorted beds of sediment.
 - The lakes are surrounded by sharp, jagged peaks and ridges.

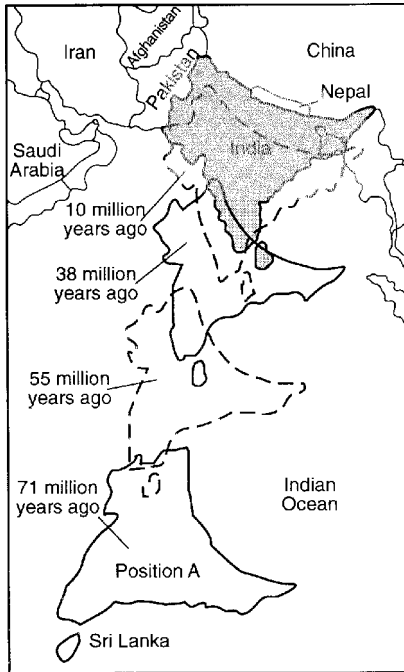
20. The block diagram below represents a deeply eroded dome.



Which map shows the stream drainage pattern that would most likely develop on this deeply eroded dome?



21. Base your answer(s) to the following question(s) on the map below. The map represents the movement of tectonic plates that resulted in the collision of India with Asia. Scientists believe that 71 million years ago, India was at position A.



Which present-day geologic feature in Nepal resulted from this collision?

- A. a rift valley B. a mountain range
C. an oceanic ridge D. an oceanic trench

22. Which life-forms were living on Earth when India was at position A?

- A. humans B. dinosaurs
C. trilobites D. armored fishes

23. Base your answer(s) to the following question(s) on the field map below, which shows the average annual precipitation in New York State for the past 25 years. Isoline values represent inches per year.



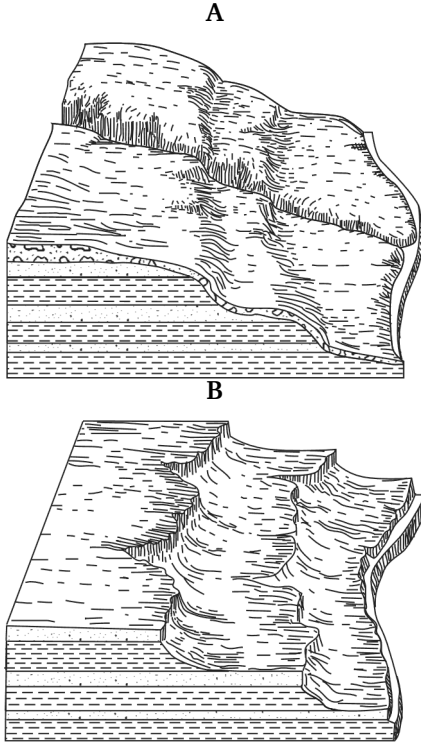
Jamestown received more rainfall per year than Elmira. A reason for this difference is that Jamestown is located

- A. closer to a large body of water
B. at a higher latitude
C. at a lower elevation
D. in the prevailing southerly wind belt

24. New York State's Finger Lakes exist today because

- A. U-shaped valleys were dammed by glacial sediments
B. V-shaped valleys are being eroded by streams
C. a drop in sea level occurred, leaving the lakes
D. a rise in sea level occurred, flooding the region

25. The block diagrams below show two landscape regions labeled *A* and *B*.



What is the most probable cause of the difference in surface features between *A* and *B*?

- A. *A* is the result of a humid climate, while *B* is the result of a dry climate.
- B. *A* is at a high elevation, while *B* is located at sea level.
- C. *A* is a plateau region, while *B* is a mountainous region.
- D. *A* is composed of igneous bedrock, while *B* is composed of sedimentary bedrock.

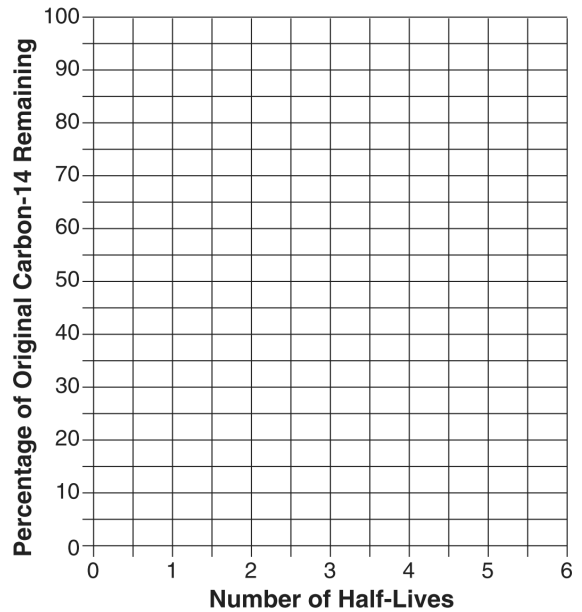
26. Base your answers to the following questions on the data table below, which shows the radioactive decay of carbon-14. The number of years required to complete four half-lives has been left blank.

Radioactive Decay of Carbon-14

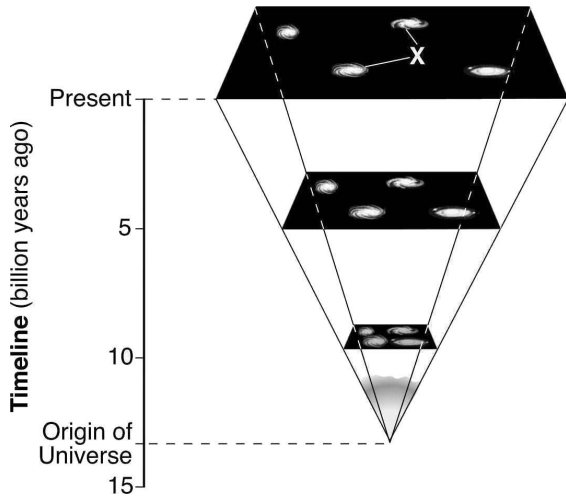
Number of Half-Lives	Percentage of Original Carbon-14 Remaining	Time (years)
0	100	0
1	50	5700
2	25	11,400
3	12.5	17,100
4	6.3	
5	3.1	28,500
6	1.6	34,200

On the grid below, construct a graph that shows the radioactive decay of carbon-14 by plotting an X to show the percentage of original carbon-14 remaining after *each* half-life. Connect the Xs with a smooth, curved line.

Radioactive Decay of Carbon-14



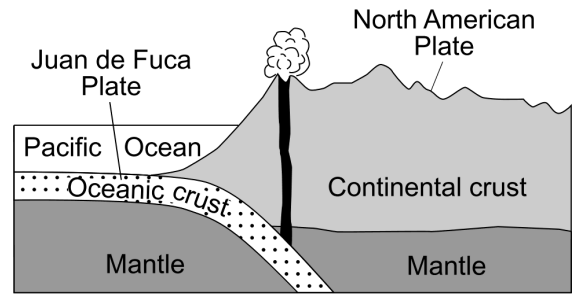
27. Base your answers to the questions on the diagram below and on your knowledge of Earth science. The diagram represents the expansion of a portion of the universe from its origin until the present. The timeline represents billions of years. Letter X indicates two celestial objects.



The two spiral-shaped celestial objects labeled X are

- A. galaxies B. planets
C. asteroids D. comets

28. Base your answers to the following questions on the cross section below. The cross section shows the boundary between the Juan de Fuca Plate and the North American Plate.

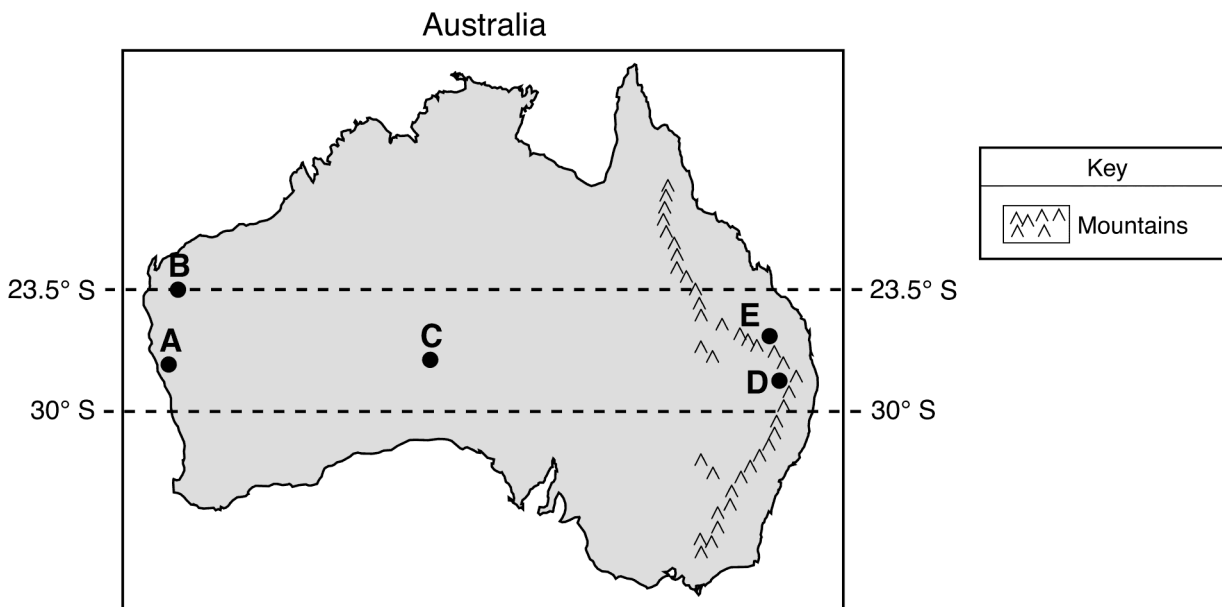


(Not drawn to scale)

Compared to the crust of the North American Plate, the crust of the Juan de Fuca Plate is

- A. thicker and less dense
B. thicker and more dense
C. thinner and less dense
D. thinner and more dense

29. Base your answers to the questions on the map of Australia below and on your knowledge of Earth science. Points A through E on the map represent locations on Earth's surface that have different climates.



Write the two-letter air-mass symbol used to identify an air mass that originates over location C.