

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

**PHYSICAL SETTING
EARTH SCIENCE**

Friday, June 19, 2015 — 9:15 a.m. to 12:15 p.m., only

The possession or use of any communications device is strictly prohibited when taking this examination. If you have or use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

Use your knowledge of Earth science to answer all questions in this examination. Before you begin this examination, you must be provided with the *2011 Edition Reference Tables for Physical Setting/Earth Science*. You will need these reference tables to answer some of the questions.

You are to answer all questions in all parts of this examination. You may use scrap paper to work out the answers to the questions, but be sure to record your answers on your answer sheet and in your answer booklet. A separate answer sheet for Part A and Part B–1 has been provided to you. Follow the instructions from the proctor for completing the student information on your answer sheet. Record your answers to the Part A and Part B–1 multiple-choice questions on this separate answer sheet. Record your answers for the questions in Part B–2 and Part C in your separate answer booklet. Be sure to fill in the heading on the front of your answer booklet.

All answers in your answer booklet should be written in pen, except for graphs and drawings, which should be done in pencil.

When you have completed the examination, you must sign the declaration printed on your separate answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet and answer booklet cannot be accepted if you fail to sign this declaration.

Notice . . .

A four-function or scientific calculator and a copy of the *2011 Edition Reference Tables for Physical Setting/Earth Science* must be available for you to use while taking this examination.

DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

Part A

Answer all questions in this part.

Directions (1–35): For *each* statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Some questions may require the use of the *2011 Edition Reference Tables for Physical Setting/Earth Science*. Record your answers on your separate answer sheet.

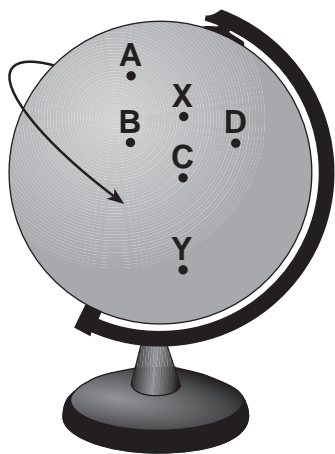
1 Compared to the terrestrial planets, the Jovian planets are

- (1) larger and less dense
- (2) smaller and more dense
- (3) closer to the Sun and less rocky
- (4) farther from the Sun and more rocky

2 Earth, the Sun, and billions of stars are contained within

- (1) a single constellation
- (2) the Milky Way galaxy
- (3) the solar system
- (4) a giant cloud of gas

3 The diagram below represents a globe that is spinning to represent Earth rotating. The globe is spinning in the direction indicated by the arrow. Points A, B, C, D, X, and Y are locations on the globe.



A student attempted to draw a straight line from point X to point Y on the spinning globe. Due to the Coriolis effect, the student's drawn line most likely passed through point

- (1) A
- (2) B
- (3) C
- (4) D

4 Flash flooding is most likely to occur when heavy rain falls on

- (1) deforested landscapes with clay soils
- (2) deforested landscapes with sandy soils
- (3) forested landscapes with clay soils
- (4) forested landscapes with sandy soils

5 Radioactive decay of ^{40}K atoms in an igneous rock has resulted in a ratio of 25 percent ^{40}K atoms to 75 percent ^{40}Ar and ^{40}Ca atoms. How many years old is this rock?

- (1) 0.3×10^9 y
- (2) 1.3×10^9 y
- (3) 2.6×10^9 y
- (4) 3.9×10^9 y

6 A student using a sling psychrometer measured a wet-bulb temperature of 10°C and a dry-bulb temperature of 16°C . What was the dewpoint?

- (1) -10°C
- (2) 45°C
- (3) 6°C
- (4) 4°C





7 Most of the hurricanes that affect the east coast of the United States originally form over the

- (1) warm waters of the Atlantic Ocean in summer
- (2) warm land of the southeastern United States in summer
- (3) cool waters of the Atlantic Ocean in spring
- (4) cool land of the southeastern United States in spring

8 The ozone layer protects life on Earth by absorbing harmful ultraviolet radiation. The ozone layer is located between 17 kilometers and 35 kilometers above Earth's surface in which atmospheric temperature zone?

- (1) troposphere
- (2) stratosphere
- (3) mesosphere
- (4) thermosphere

9 Which weather map symbol is associated with extremely low air pressure?

-  (1)  (2)  (3)  (4)

10 Which two elements make up the greatest percentages by mass in Earth's crust?

- (1) oxygen and potassium
- (2) oxygen and silicon
- (3) aluminum and potassium
- (4) aluminum and silicon

11 What is the approximate *P*-wave travel time from an earthquake if the *P*-wave arrives at the seismic station 8 minutes before the *S*-wave?

- (1) 4 minutes 20 seconds
- (2) 6 minutes 30 seconds
- (3) 10 minutes 0 seconds
- (4) 11 minutes 20 seconds

12 Which two factors have the most influence on the development of landscape features?

- (1) bedrock age and weathering rates
- (2) bedrock structure and climate variations
- (3) rate of deposition and thickness of the bedrock
- (4) rate of erosion and fossils in the bedrock

13 Which two New York State landscape regions have surface bedrock that formed about 1000 million years ago?

- (1) Hudson Highlands and Adirondack Mountains
- (2) Erie-Ontario Lowlands and Atlantic Coastal Plain
- (3) Tug Hill Plateau and Allegheny Plateau
- (4) Newark Lowlands and Manhattan Prong

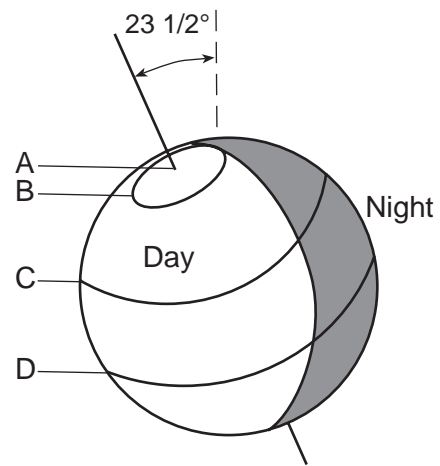
14 What is the minimum water velocity necessary to maintain movement of 0.1-centimeter-diameter particles in a stream?

- (1) 0.02 cm/s (3) 5.0 cm/s
- (2) 0.5 cm/s (4) 20.0 cm/s

15 Compared to a light-colored rock with a smooth surface, a dark-colored rock with a rough surface will

- (1) both absorb and reflect less insolation
- (2) both absorb and reflect more insolation
- (3) absorb less insolation and reflect more insolation
- (4) absorb more insolation and reflect less insolation

16 The diagram below indicates regions of daylight and darkness on Earth on the first day of summer in the Northern Hemisphere. Four latitudes are labeled A, B, C, and D.



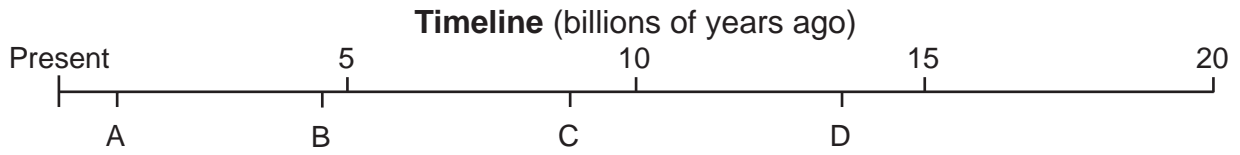
At which latitude is the Sun above the horizon for the *least* number of hours on the day shown?

- (1) A (3) C
- (2) B (4) D

17 Which process is responsible for the greatest loss of energy from Earth's surface into space on a clear night?

- (1) condensation (3) radiation
- (2) conduction (4) convection

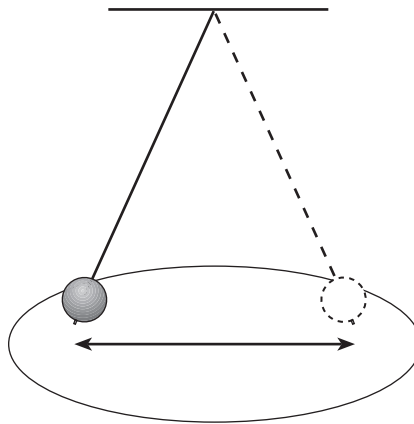
18 The timeline below represents time from the present to 20 billion years ago. Letters A, B, C, and D represent specific times.



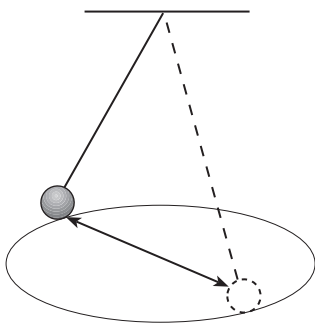
Which letter on the timeline best represents the time when scientists estimate that the Big Bang occurred?

- (1) A
- (2) B
- (3) C
- (4) D

19 The diagram below represents a Foucault pendulum that is swinging back and forth.

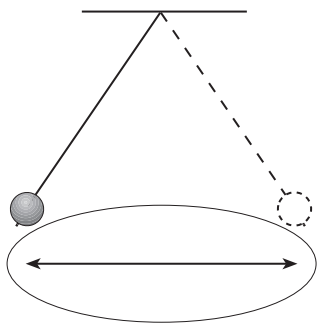


Which diagram best represents the change in the motion of a Foucault pendulum that provides evidence of Earth's rotation?



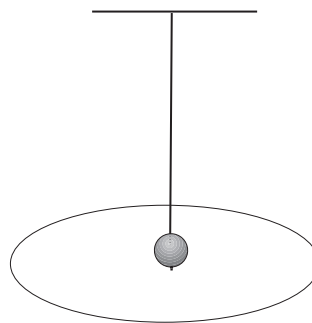
Different direction of swing

(1)



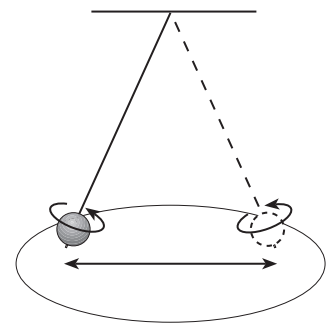
Longer length of swing

(2)



Swinging stops

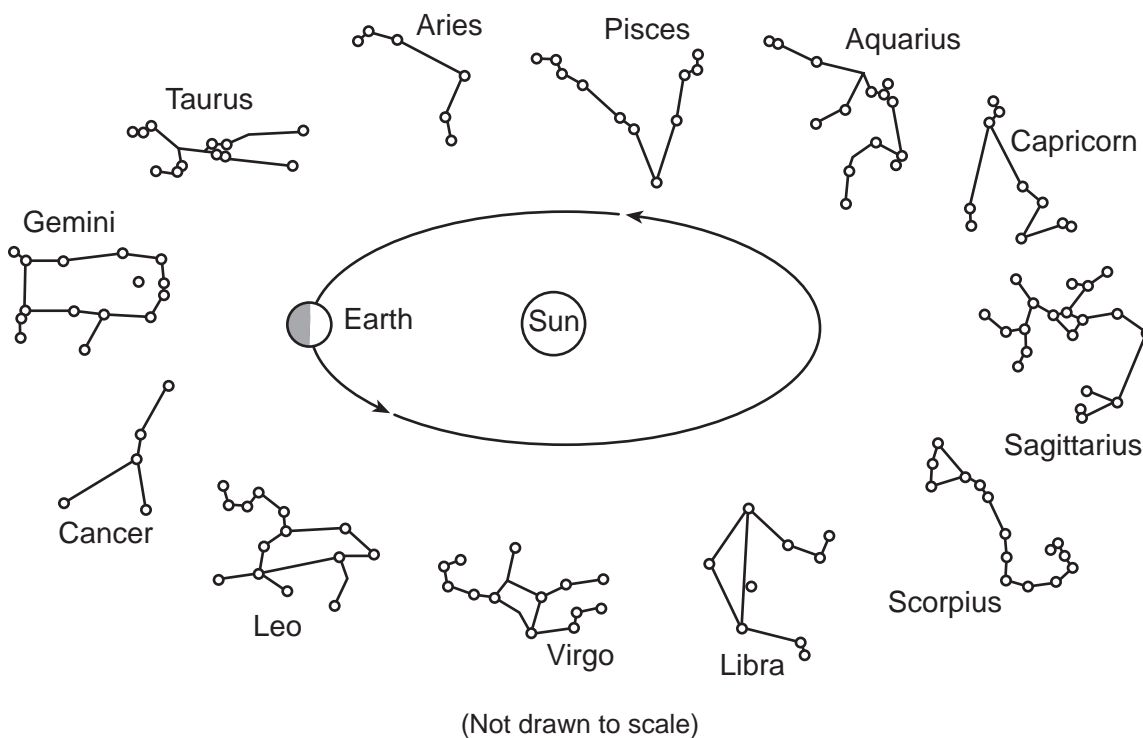
(3)



Begins to spin

(4)

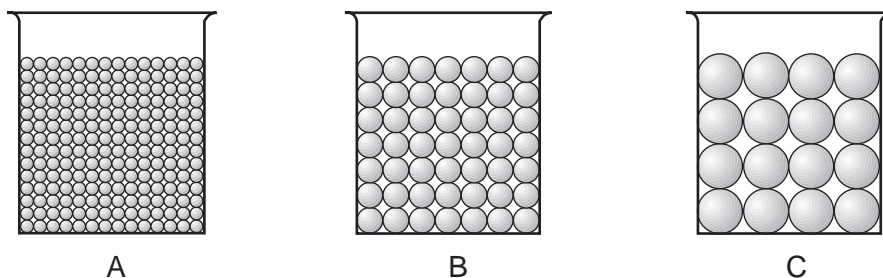
20 The diagram below represents some constellations and one position of Earth in its orbit around the Sun. These constellations are visible to an observer on Earth at different times of the year.



When Earth is located in the orbital position shown, two constellations that are both visible to an observer on Earth at midnight are

- (1) Libra and Virgo
- (2) Gemini and Taurus
- (3) Aquarius and Capricorn
- (4) Cancer and Sagittarius

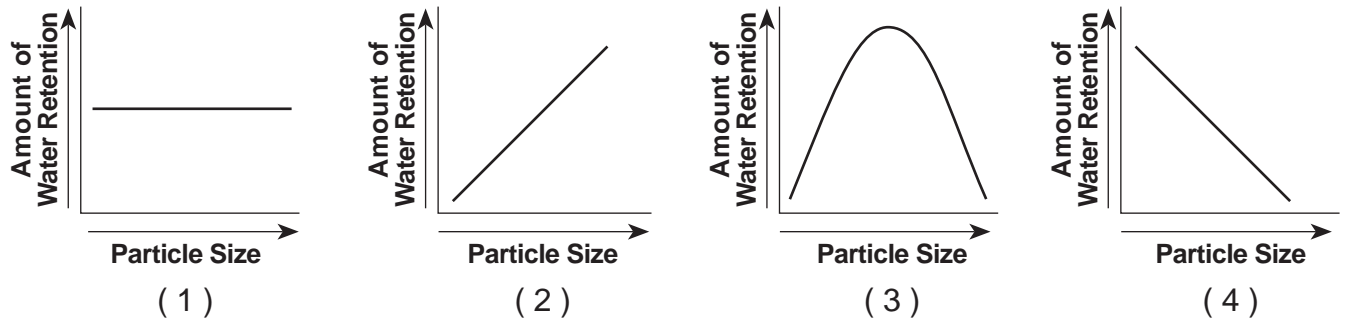
21 The cross sections below represent three beakers that were used to test porosity. Beakers A, B, and C each contain a different size of bead. Each beaker holds an equal volume of beads. The amount of water needed to fill the total pore space between the beads in each beaker was measured.



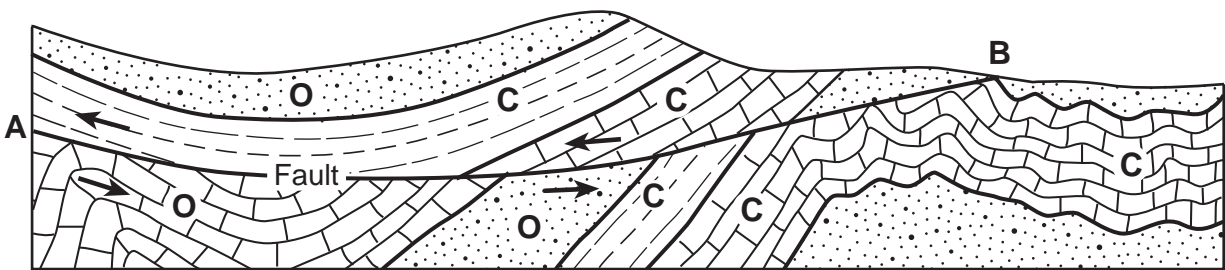
Which statement best describes the porosity that was found for these three samples?

- (1) A had a greater porosity than B and C.
- (2) B had a greater porosity than A and C.
- (3) C had a greater porosity than A and B.
- (4) All three samples had the same porosity.

22 Which graph best indicates the general relationship between soil particle size and the amount of water retention by a permeable soil?



23 The cross section below represents surface bedrock where faulting has occurred along line AB.

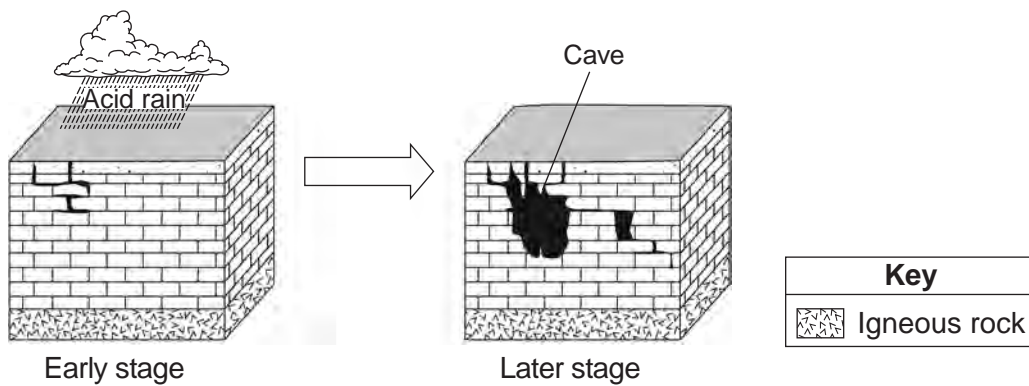


Key to Rock Age	
O	— Ordovician
C	— Cambrian

When could this faulting have occurred?

- (1) before the Ordovician rocks were deposited (3) before the Cambrian rocks were deposited
 (2) during the Ordovician period (4) during the Cambrian period

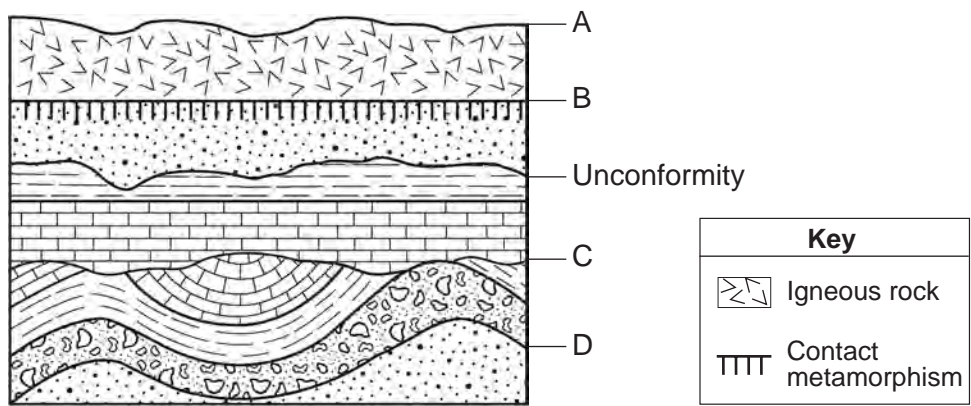
24 The two block diagrams below represent the formation of caves.



Which types of weathering and erosion are primarily responsible for the formation of caves?

- (1) chemical weathering and groundwater flow (3) physical weathering and groundwater flow
 (2) chemical weathering and runoff (4) physical weathering and runoff

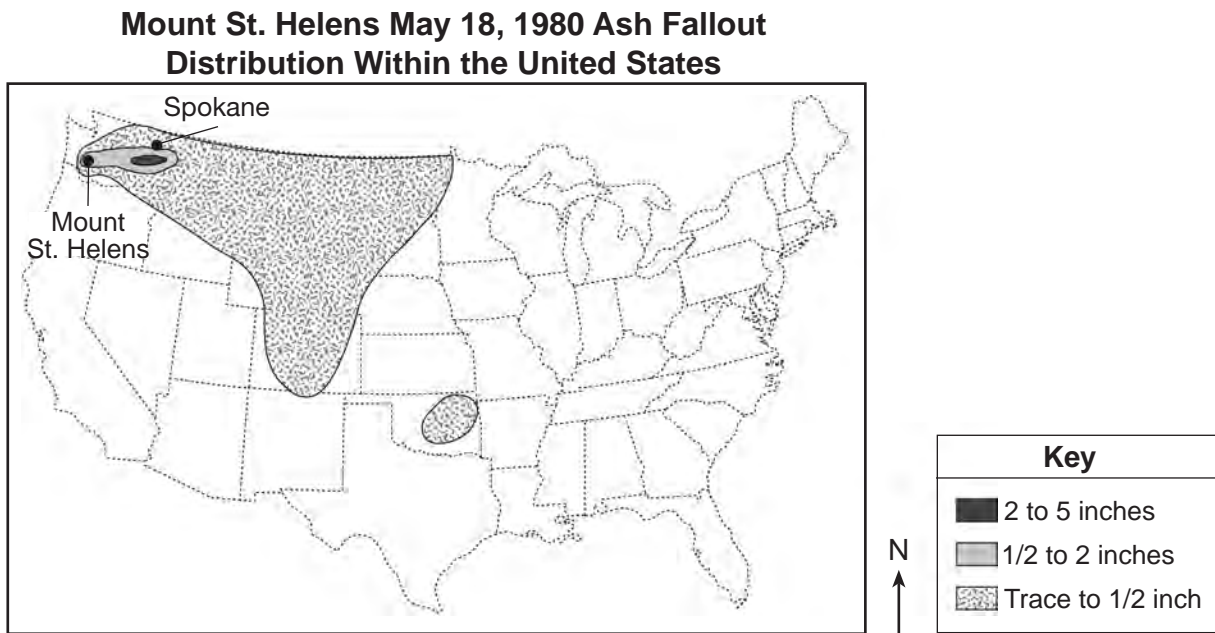
25 The cross section below represents several rock units within Earth's crust. Letter A represents Earth's surface. Letters B, C, and D indicate boundaries between rock units. One of the unconformities is labeled.



Which lettered boundary is most likely another unconformity?

- (1) A
- (2) B
- (3) C
- (4) D

26 The map below shows the distribution of ash across the United States as a result of the May 18, 1980 volcanic eruption of Mount St. Helens.

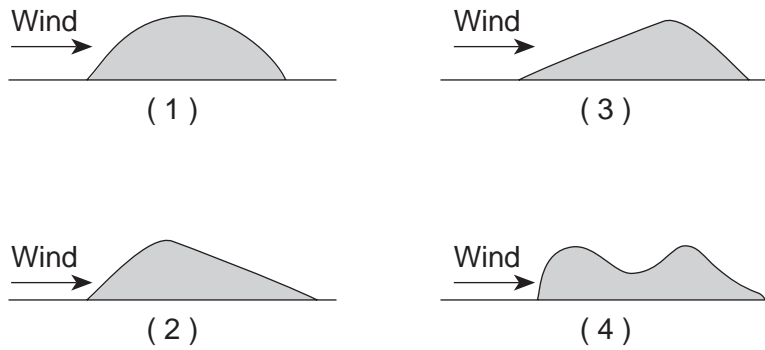


Source: United States Geological Survey, 1990 (adapted)

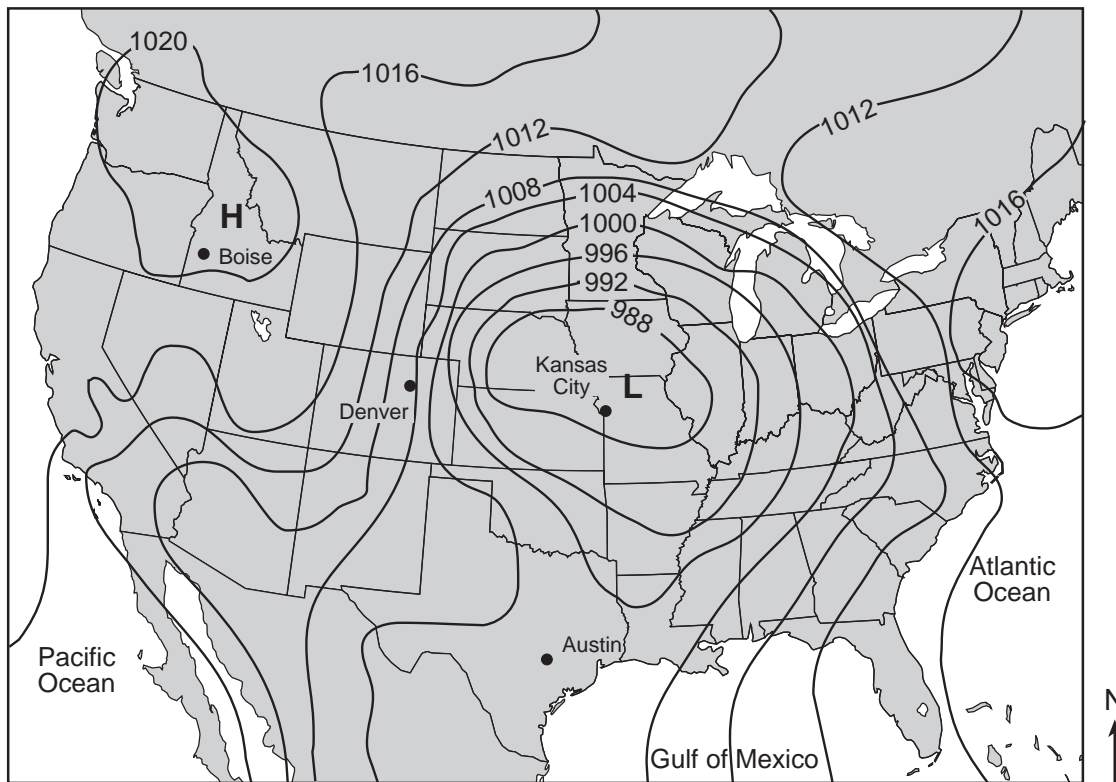
Volcanic ash deposits such as these are usually excellent geologic time markers because they

- (1) occur at regular time intervals
- (2) spread over a large area in a short amount of time
- (3) represent a time gap in the rock record
- (4) contain index fossils from different time periods

27 Which diagram represents a side view of a sand dune most commonly formed as a result of the prevailing wind direction shown?



28 The map below indicates an air-pressure field over North America. Isobar values are recorded in millibars.



At which city was the greatest wind speed occurring?

- (1) Boise
- (2) Denver
- (3) Kansas City
- (4) Austin

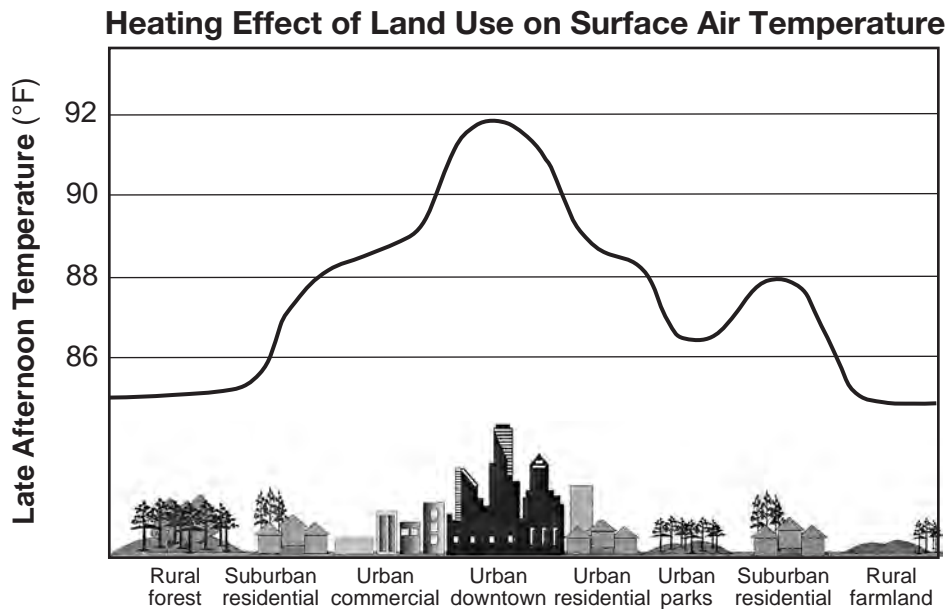
29 The striped areas on the map below show regions along the Great Lakes that often receive large amounts of snowfall due to lake-effect storms.



These storms generally develop when

- (1) cold air moves to the east over warmer lake water
- (2) cold air moves to the west over warmer land regions
- (3) warm air moves to the east over colder lake water
- (4) warm air moves to the west over colder land regions

30 The graph below shows the heating effect that different land uses have on surface air temperatures on a summer afternoon.

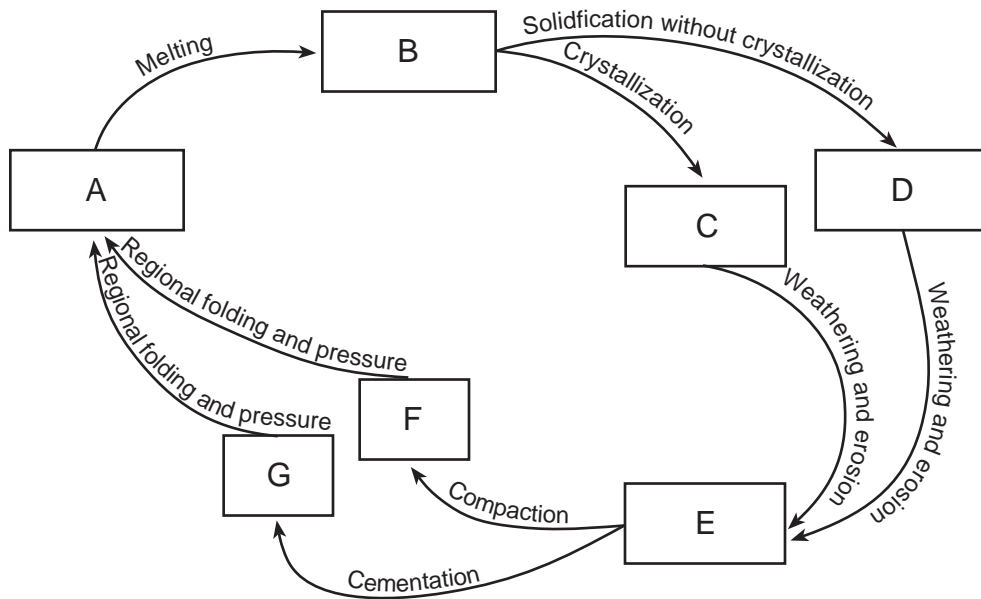


Source: US Global Change Research Program (adapted)

Which land use results in the *least* heating effect in urban areas?

- (1) commercial
- (2) downtown
- (3) residential
- (4) parks

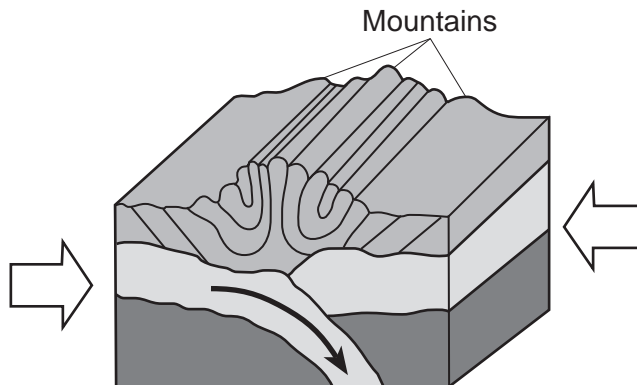
Base your answers to questions 31 and 32 on the flowchart below and on your knowledge of Earth science. The boxes labeled A through G represent rocks and rock materials. Arrows represent the processes of the rock cycle.



31 Which lettered box could represent the rock conglomerate?

- (1) *E*
- (2) *G*
- (3) *C*
- (4) *D*

32 The arrows in the block diagram below represent forces forming mountains in a region of Earth's lithosphere.



Metamorphic rocks that formed from these forces are represented by which lettered box in the flowchart?

- (1) *A*
- (2) *B*
- (3) *E*
- (4) *F*

33 Which rock is composed of the mineral halite that formed when seawater evaporated?

- (1) limestone
- (2) dolostone
- (3) rock gypsum
- (4) rock salt

34 Which mineral is mined for its iron content?

- (1) hematite
- (2) fluorite
- (3) galena
- (4) talc

35 The data table below gives characteristics of the gemstone peridot.

Characteristics of Peridot

Luster	nonmetallic
Hardness	6.5
Color	green
Composition	$(\text{Fe}, \text{Mg})_2\text{SiO}_4$

Peridot is a form of the mineral

- (1) pyrite
 - (2) pyroxene
 - (3) olivine
 - (4) garnet
-

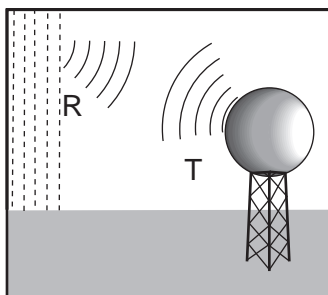
Part B-1

Answer all questions in this part.

Directions (36–50): For *each* statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Some questions may require the use of the *2011 Edition Reference Tables for Physical Setting/Earth Science*. Record your answers on your separate answer sheet.

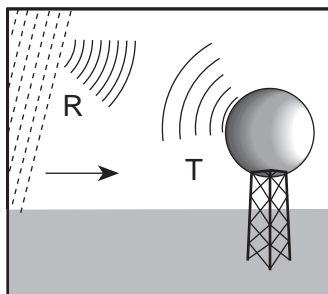
Base your answers to questions 36 through 38 on the diagrams below and on your knowledge of Earth science. The diagrams represent electromagnetic waves being transmitted (*T*) by a Doppler radar weather instrument and waves being reflected (*R*) by rain showers. This instrument produces computer images that show the movement of rainstorms.

A Stationary Rain Shower



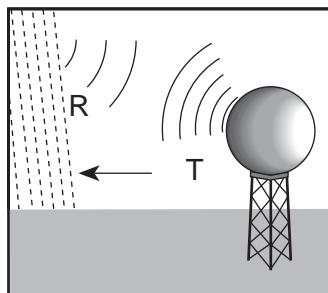
The reflected wavelengths (*R*) from a stationary rain shower are equal to the transmitted wavelengths (*T*).

A Rain Shower Moving Toward the Instrument



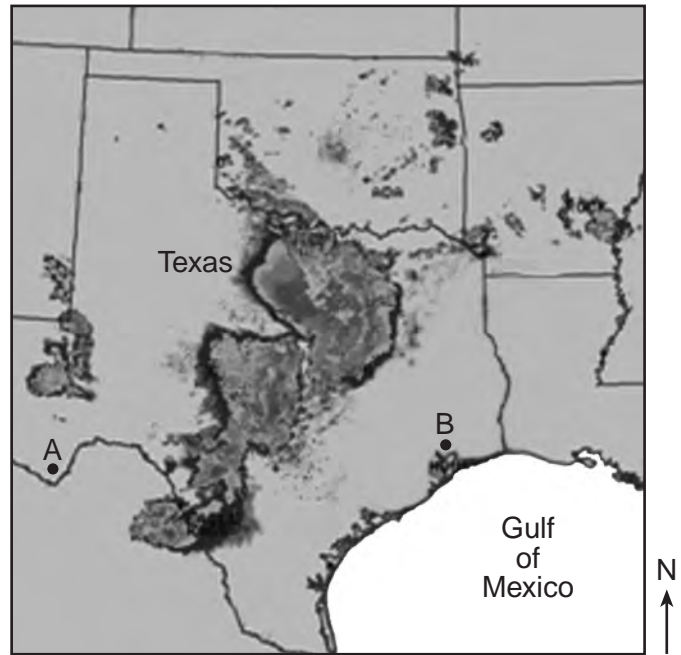
The reflected wavelengths (*R*) from a rain shower moving toward the instrument are shorter than the transmitted wavelengths (*T*).

A Rain Shower Moving Away from the Instrument



The reflected wavelengths (*R*) from a rain shower moving away from the instrument are longer than the transmitted wavelengths (*T*).

36 The computer image below shows a rainstorm over Texas. Letters *A* and *B* represent locations on Earth's surface.



If Doppler radar is used at locations *A* and *B*, as this rainstorm moves eastward, reflected wavelengths from this storm will be

- (1) shorter at both locations *A* and *B*
- (2) longer at both locations *A* and *B*
- (3) shorter at location *A* and longer at location *B*
- (4) longer at location *A* and shorter at location *B*

37 This Doppler radar instrument transmits electromagnetic energy in the form of microwaves. Some microwave wavelengths are between the wavelengths of

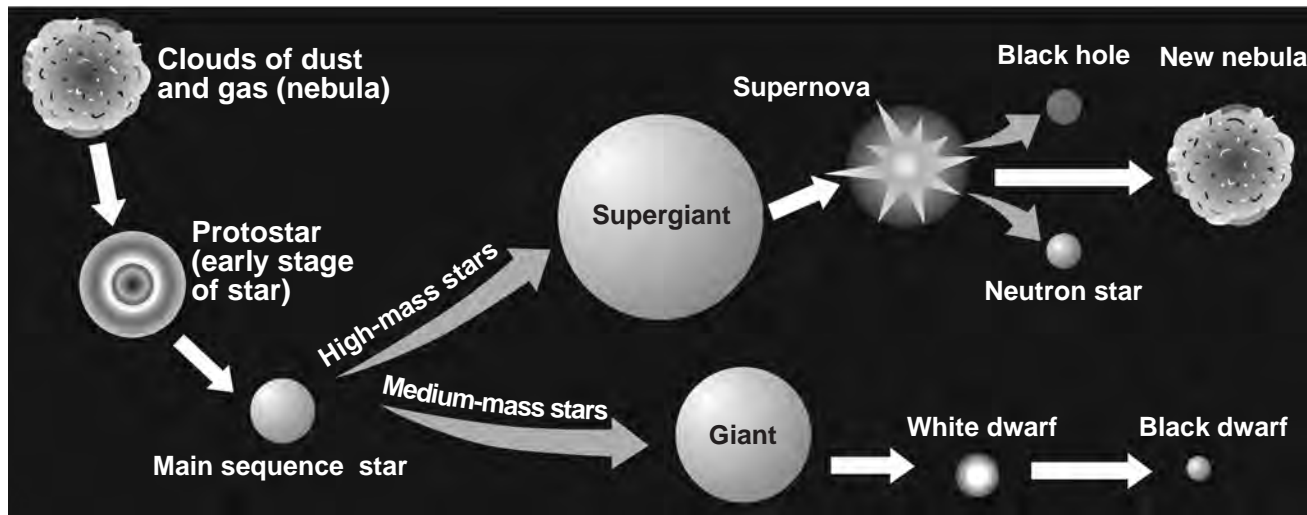
- (1) gamma rays and x rays
- (2) infrared and radio waves
- (3) ultraviolet and infrared
- (4) x rays and ultraviolet

38 Which weather instrument was used to measure the amount of rainfall from this storm?

- (1) barometer
 - (2) anemometer
 - (3) precipitation gauge
 - (4) wind vane
-

Base your answers to questions 39 through 42 on the diagram below and on your knowledge of Earth science. The diagram represents two possible sequences in the evolution of stars.

Stages of Star Evolution



(Not drawn to scale)

39 What causes clouds of dust and gas to form a protostar?

- (1) magnetism
- (2) gravitational attraction
- (3) expansion of matter
- (4) cosmic background radiation

40 Which property primarily determines whether a giant star or a supergiant star will form?

- (1) mass
- (2) color
- (3) shape
- (4) composition

41 Which table includes data that are characteristic of the surface temperature and luminosity of some white dwarf stars?

Surface Temperature	5000 K
Luminosity	100

(1)

Surface Temperature	10,000 K
Luminosity	100

(3)

Surface Temperature	5000 K
Luminosity	0.001

(2)

Surface Temperature	10,000 K
Luminosity	0.001

(4)

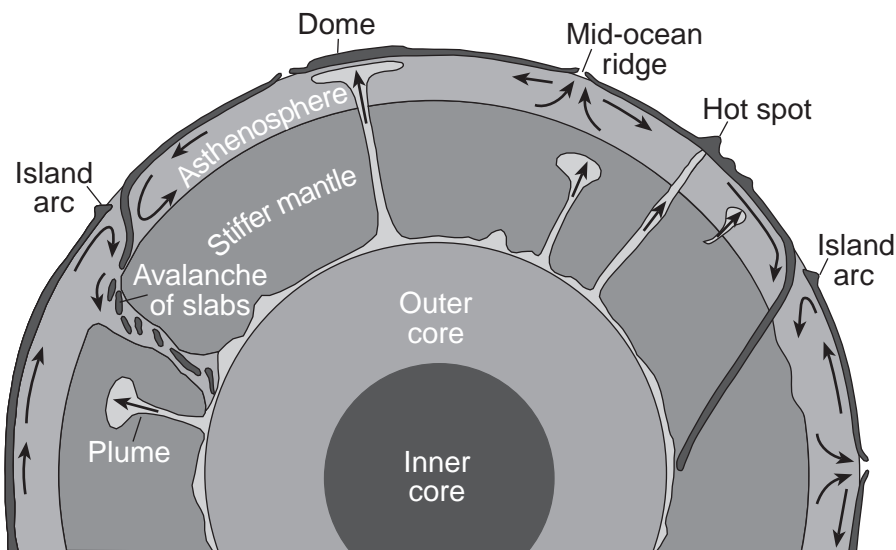
42 Which process generates the energy that is released by stars?

- (1) nuclear fusion
- (2) thermal conduction
- (3) convection currents
- (4) radioactive decay

Base your answers to questions 43 through 45 on the passage and cross section below and on your knowledge of Earth science. The cross section represents one theory of the movement of rock materials in Earth's dynamic interior. Some mantle plumes that are slowly rising from the boundary between Earth's outer core and stiffer mantle are indicated.

Hot Spots and Mantle Plumes

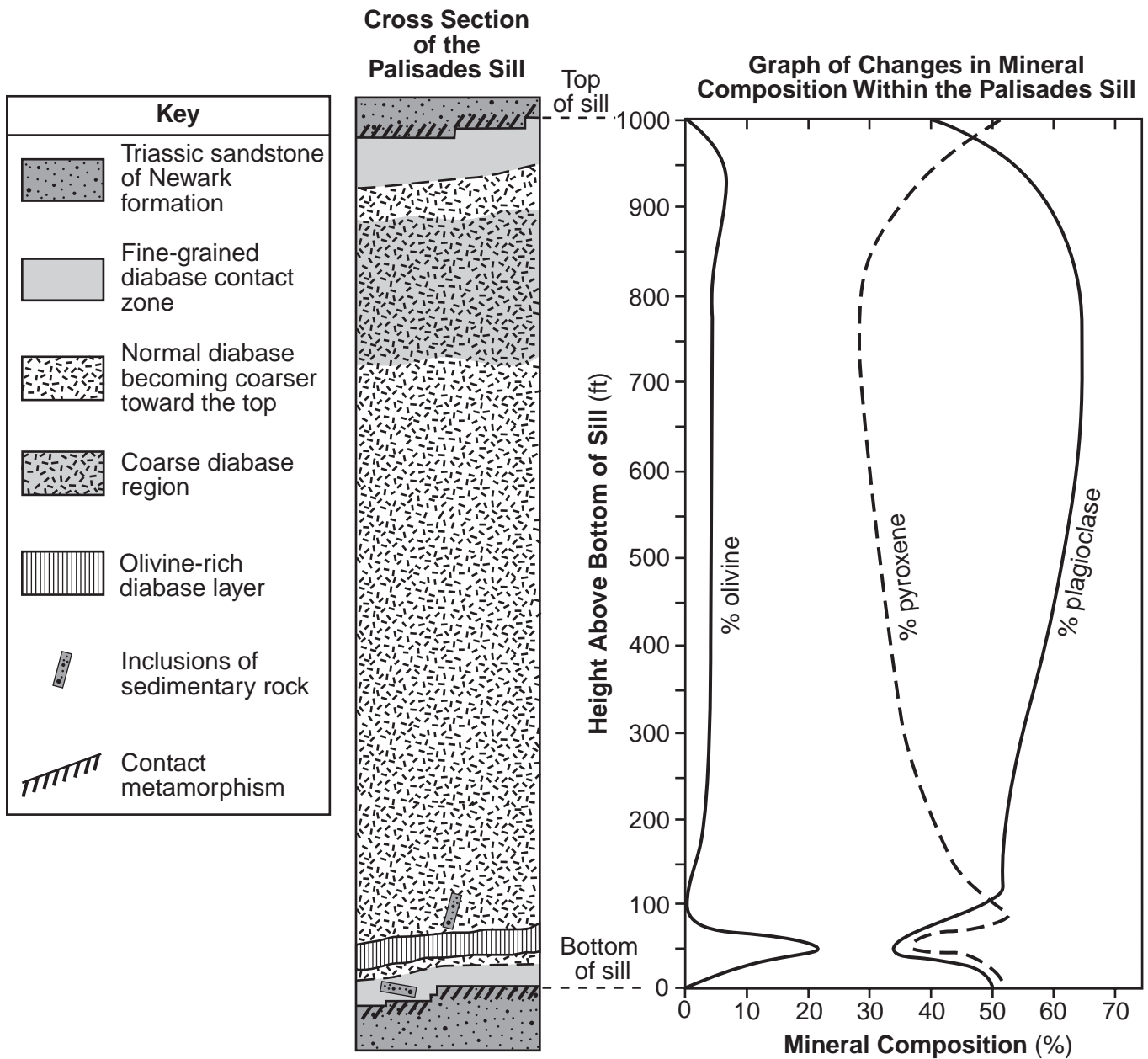
Research of mantle hot spots indicates that mantle plumes form in a variety of sizes and shapes. These mantle plumes range in diameter from several hundred kilometers to 1000 kilometers. Some plumes rise as blobs rather than in a continuous streak; however, most plumes are long, slender columns of hot rock slowly rising in Earth's stiffer mantle. One theory is that most plumes form at the boundary between the outer core and the stiffer mantle. They may reach Earth's surface in the center of plates or at plate boundaries, producing volcanoes or large domes.



(Not drawn to scale)

- 43 Compared to the surrounding material, mantle plumes rise toward Earth's surface from the core-mantle boundary because they are
- | | |
|---------------------------|---------------------------|
| (1) cooler and less dense | (3) hotter and less dense |
| (2) cooler and more dense | (4) hotter and more dense |
- 44 At which depth below Earth's surface is the boundary between Earth's outer core and stiffer mantle located?
- | | |
|-------------|-------------|
| (1) 700 km | (3) 2900 km |
| (2) 2000 km | (4) 5100 km |
- 45 The basaltic rock that forms volcanic mountains where mantle plumes reach Earth's surface is usually composed of
- | | |
|--|---|
| (1) fine-grained, dark-colored felsic minerals | (3) coarse-grained, light-colored felsic minerals |
| (2) fine-grained, dark-colored mafic minerals | (4) coarse-grained, light-colored mafic minerals |

Base your answers to questions 46 through 50 on the geologic cross section and graph below, and on your knowledge of Earth science. The cross section represents the intrusive igneous rock of the Palisades sill and surrounding bedrock located on the west side of the Hudson River across from New York City. The graph indicates changes in the percentages of the major minerals found in the sill.



- 46 The inclusions shown near the bottom of the Palisades sill are pieces of the Triassic sandstone that
- (1) formed from deposits of minerals within the sill
 - (2) crystallized within the sill and were cemented together
 - (3) were part of the olivine-rich layer that broke apart
 - (4) broke off from the surrounding bedrock during the intrusion

- 47 Approximately how far above the bottom of the Palisades sill is the coarse diabase region found?
- (1) 50 ft
 - (2) 400 ft
 - (3) 800 ft
 - (4) 950 ft
- 48 The graph shows that, within the olivine-rich diabase layer near the bottom of the sill, as the percentage of olivine increases, the
- (1) percentages of both plagioclase and pyroxene decrease
 - (2) percentages of both plagioclase and pyroxene increase
 - (3) percentage of plagioclase decreases and the percentage of pyroxene increases
 - (4) percentage of plagioclase increases and the percentage of pyroxene decreases
- 49 The Palisades sill intruded as North America began the process of separating from Africa and Europe as Pangaea was breaking apart. Approximately when did these events occur?
- (1) 65 million years ago
 - (2) 200 million years ago
 - (3) 299 million years ago
 - (4) 400 million years ago
- 50 Which two minerals, *not* shown on the Graph of Changes in Mineral Composition Within the Palisades Sill, are also likely to be found in some other samples of diabase?
- (1) amphibole and potassium feldspar
 - (2) potassium feldspar and quartz
 - (3) quartz and biotite
 - (4) biotite and amphibole
-

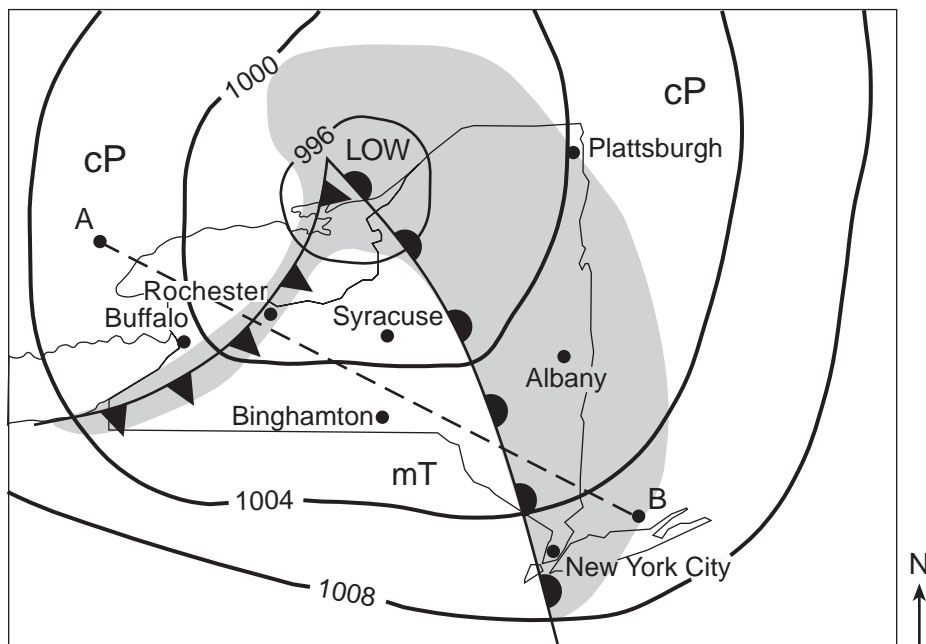
Part B-2

Answer all questions in this part.

Directions (51–65): Record your answers in the spaces provided in your answer booklet. Some questions may require the use of the *2011 Edition Reference Tables for Physical Setting/Earth Science*.

51 Describe the effect that global warming most likely will have on *both* present-day glaciers and sea level. [1]

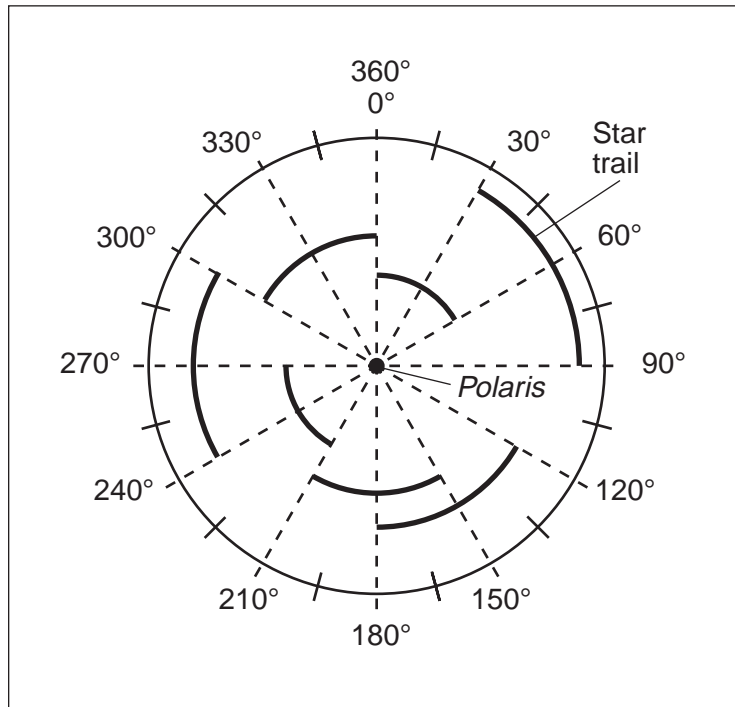
Base your answers to questions 52 and 53 on the weather map below and on your knowledge of Earth science. The map indicates the location of a low-pressure system over New York State during late summer. Isobar values are recorded in millibars. Shading indicates regions receiving precipitation. The air masses are labeled mT and cP. The locations of some New York State cities are shown. Points A and B represent other locations on Earth's surface.



52 An air mass acquires the characteristics of the surface over which it forms. *In your answer booklet*, circle the type of Earth surface (land or ocean) and describe the relative temperature of the surface over which the mT air mass most likely formed. [1]

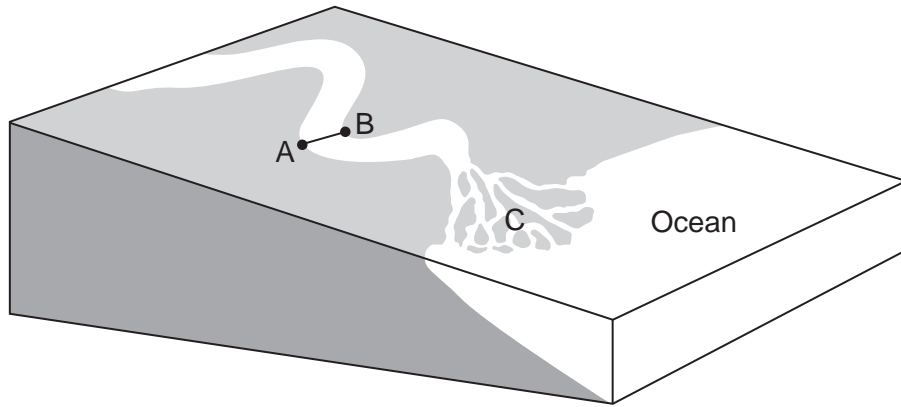
53 The cross section *in your answer booklet* represents the atmosphere along the dashed line from A to B on the map. The warm frontal boundary is already shown on the cross section. Draw a curved line to represent the shape and location of the cold frontal boundary. [1]

Base your answers to questions 54 through 57 on the diagram below and on your knowledge of Earth science. The diagram represents a time-exposure photograph taken by aiming a camera at *Polaris* in the night sky and leaving the shutter open for a period of time to record star trails. The angular arcs (star trails) show the apparent motions of some stars.



- 54 Identify the motion of Earth that causes these stars to appear to move in a circular path. [1]
- 55 Determine the number of hours it took to record the star trails labeled on the diagram. [1]
- 56 The diagram in your answer booklet represents Earth as viewed from space. The dashed line indicates Earth's axis. Some latitudes are labeled. On the diagram *in your answer booklet*, draw an arrow that points from the North Pole toward *Polaris*. [1]
- 57 Record, to the *nearest whole degree*, the altitude of *Polaris* when it is viewed from the top of New York State's Mt. Marcy. [1]
-

Base your answers to questions 58 through 61 on the block diagram below and on your knowledge of Earth science. The diagram represents a meandering stream flowing into the ocean. Points *A* and *B* represent locations along the streambanks. Letter *C* indicates a triangular-shaped depositional feature where the stream enters the ocean.



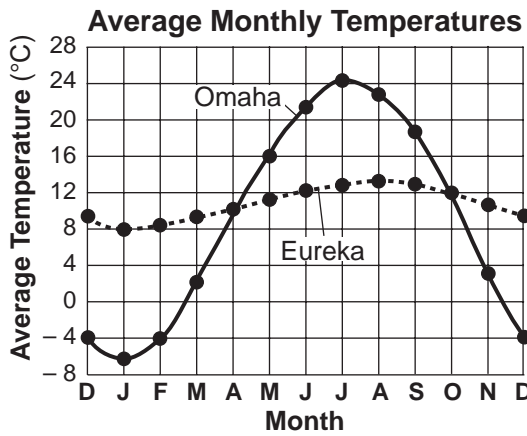
58 The top of the box *in your answer booklet* represents the stream surface between points *A* and *B*. In the box, draw a line from point *A* to point *B* to represent a cross-sectional view of the shape of the bottom of the stream channel. [1]

59 Explain how sediments eroded by the water in this stream become smoother and rounder in shape. [1]

60 Identify the triangular-shaped depositional feature indicated by letter *C*. [1]

61 Identify *two* factors that determine the rate of stream erosion. [1]

Base your answers to questions 62 through 65 on the graph and map below and on your knowledge of Earth science. The average monthly temperatures for Eureka, California, and Omaha, Nebraska, are plotted on the graph. The map indicates the locations of these two cities.



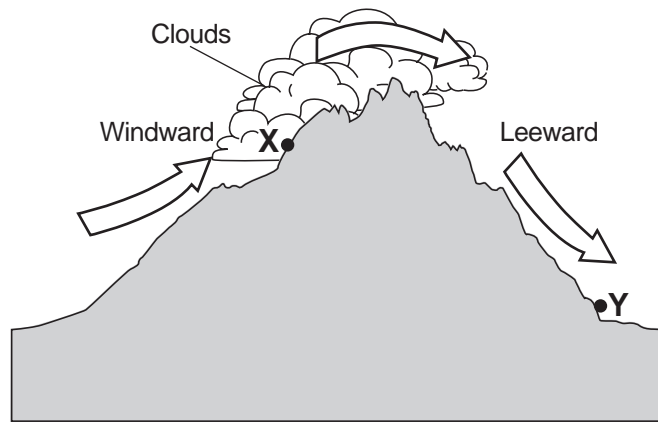
- 62 Calculate the rate of change in the average monthly temperature for Omaha during the two-month period between October and December, as shown on the graph. [1]
- 63 Explain why Omaha, which is farther inland, has a greater variation in temperatures throughout the year than Eureka, which is closer to the ocean. [1]
- 64 Identify the month with the greatest difference in the average temperature between these two cities. [1]
- 65 Identify the surface ocean current that affects the climate of Eureka. [1]
-

Part C

Answer all questions in this part.

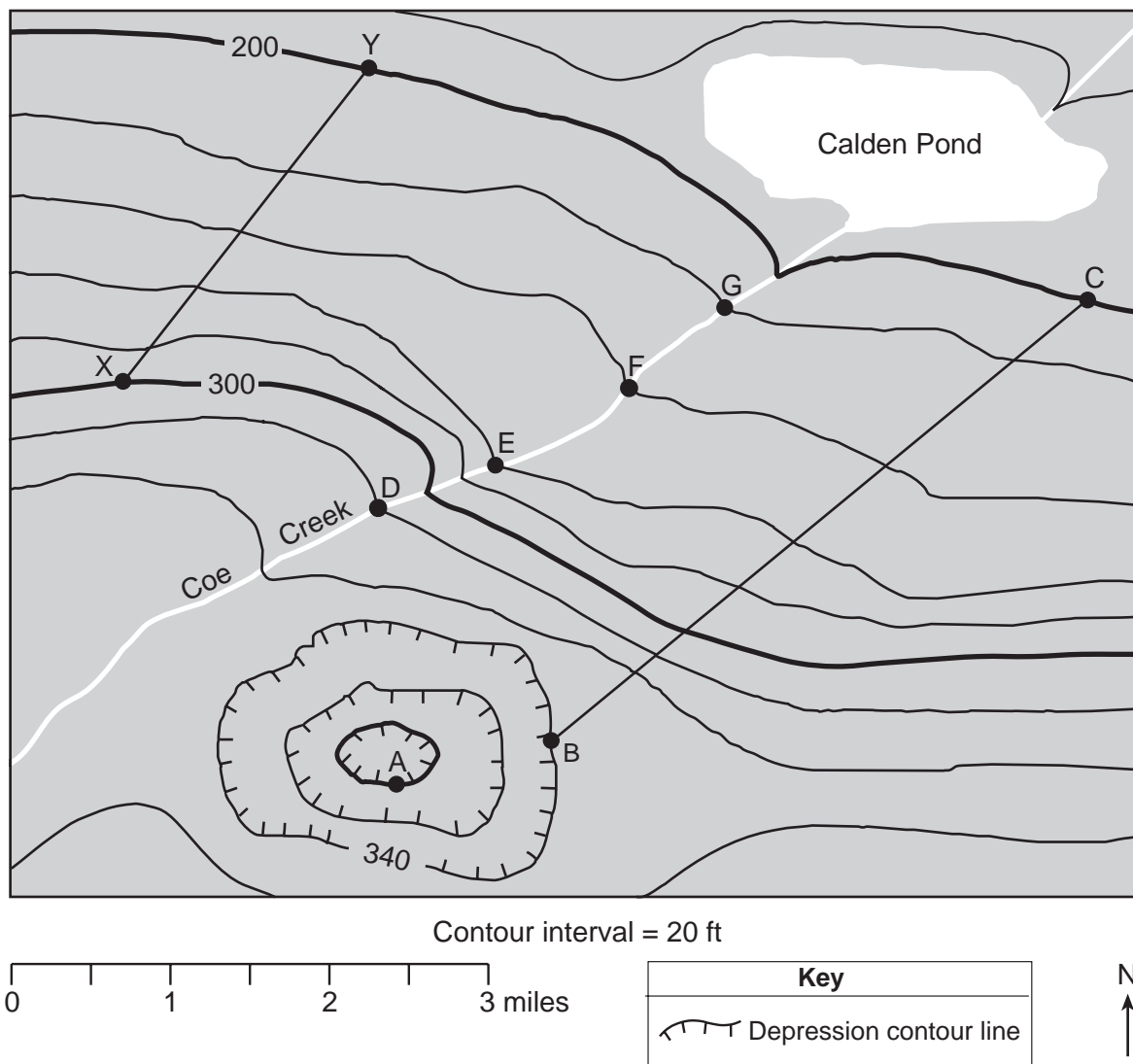
Directions (66–85): Record your answers in the spaces provided in your answer booklet. Some questions may require the use of the *2011 Edition Reference Tables for Physical Setting/Earth Science*.

- 66 The cross section below represents the windward and leeward sides of a mountain range. Arrows show the movement of air over a mountain. Points X and Y represent locations on Earth's surface.



Describe how the air's temperature and water vapor content at point X is different from the air's temperature and water vapor content at point Y. [1]

Base your answers to questions 67 through 71 on the topographic map below and on your knowledge of Earth science. Point A represents a location on Earth's surface. Lines BC and XY are reference lines on the map. Points D, E, F, and G represent locations along Coe Creek. Elevations are shown in feet.



- 67 What is the elevation of location A? [1]
- 68 On the grid in your answer booklet, construct a topographic profile of the land surface along the line from point B to point C. Plot the elevation of each contour line that crosses line BC. Connect all nine plots with a line to complete the profile. [1]
- 69 Describe the evidence shown on the map that indicates Coe Creek flows toward the northeast. [1]
- 70 Describe how the contour lines indicate that Coe Creek flows faster between locations D and E than between locations F and G. [1]
- 71 Calculate the gradient along line XY. Label your answer with the correct units. [1]

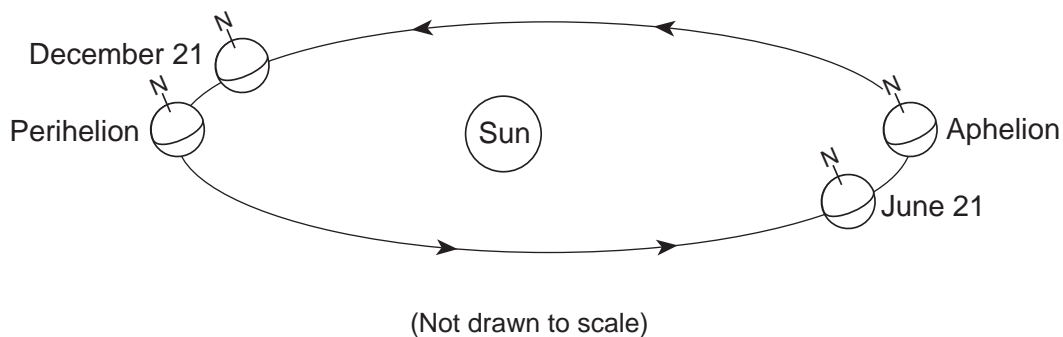
Base your answers to questions 72 through 76 on the modified Mercalli scale of earthquake intensity below, on the map of Japan in your answer booklet, and on your knowledge of Earth science. The modified Mercalli scale classifies earthquake intensity based on observations made during an earthquake. The map indicates the modified Mercalli scale intensity values recorded at several locations in Japan during the March 11, 2011 earthquake, which triggered destructive tsunamis in the Pacific Ocean.

Modified Mercalli Scale of Earthquake Intensity

Intensity Value	Description of Effects
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Parked cars may rock slightly. Vibrations similar to the passing of a truck.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Parked cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage minimal in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage with partial collapse in ordinary substantial buildings. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures tilted. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Most masonry and frame structures and foundations are destroyed. Train rails bent.
XI	Few, if any, structures remain standing. Bridges destroyed. Train rails bent greatly.
XII	Damage total. Objects thrown into the air.

- 72 On the map *in your answer booklet*, a line has been drawn to separate regions with Mercalli values of V from regions with Mercalli values of VI. Draw *another* line to separate regions with Mercalli values of VI from regions with Mercalli values of VII. [1]
- 73 Your answer booklet lists some observations that might be made during an earthquake according to the modified Mercalli scale. *In your answer booklet*, place a check mark (✓) in the box if that observation most likely was recorded at Yamagata during the March 11, 2011 earthquake. More than one box may be checked. [1]
- 74 The epicenter of this earthquake was located at 38° N 142° E. Identify the type of tectonic plate boundary that is located nearest to the epicenter of this earthquake. [1]
- 75 Describe *one* way the *P*-waves and *S*-waves recorded on seismograms at Ishinomaki and Nagano were used to indicate that Ishinomaki was closer to the earthquake epicenter than was Nagano. [1]
- 76 A 25-foot high tsunami hit the Japanese city of Ishinomaki. Describe a precaution the city could take now to protect citizens from tsunamis in future years. [1]
-

Base your answers to questions 77 and 78 on the diagram below, which represents an exaggerated model of the shape of Earth's orbit, and on your knowledge of Earth science. The positions of Earth in its orbit on December 21 and June 21 are indicated. The positions of perihelion (when Earth is closest to the Sun) and aphelion (when Earth is farthest from the Sun) are also indicated. Both perihelion and aphelion occur approximately two weeks after the dates shown.



- 77 How many months after Earth's perihelion position does Earth's aphelion position occur? [1]
- 78 Explain why warm summer temperatures occur in New York State when Earth is at aphelion. [1]
-

Base your answers to questions 79 through 82 on the passage and chart below, and on your knowledge of Earth science. The chart identifies some human species and the times when they are believed to have existed.

Human Species

Modern humans, *Homo sapiens*, appear to have evolved through several species of earlier members of the genus *Homo*. Each of these human species possessed specific features that made that species distinct. Many lived in (or at least have been discovered in) specific geographic areas, and existed for specific time ranges shown in the chart. In many cases, fossil remains are partial, often consisting of only teeth and skulls. Interpretation of human evolution continues to change with new discoveries.

Human Species Distributed Through Time

Human Species	Time of Existence from Fossil Evidence (million years ago)
<i>Homo sapiens</i>	0.25 to the present
<i>Homo neanderthalensis</i>	0.35 to 0.03
<i>Homo rhodesiensis</i>	0.6 to 0.1
<i>Homo heidelbergensis</i>	0.6 to 0.3
<i>Homo mauritanicus</i>	1.2 to 0.6
<i>Homo erectus</i>	1.5 to 0.2
<i>Homo ergaster</i>	1.8 to 1.25
<i>Homo habilis</i>	2.25 to 1.4

79 Complete the graph in your answer booklet by drawing a bar to represent the time span that each human species existed. The bars for the first four species listed have already been drawn. [1]

80 Which human species shown in the chart was the first to exist? [1]

81 One species of the genus *Homo* could have evolved directly from another species of the genus *Homo* only if the other species:

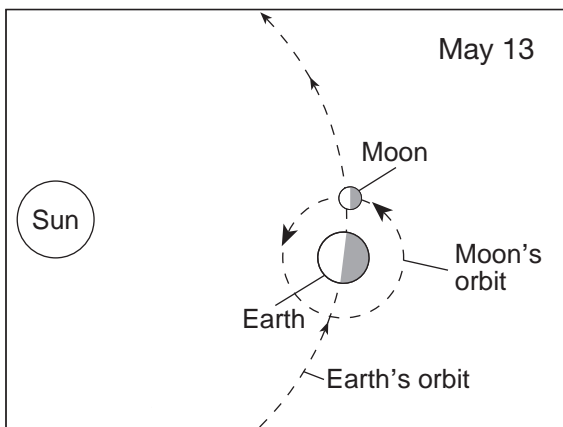
- existed before the new species appeared
- did not become extinct before the new species appeared

Identify two species of the genus *Homo* from which *Homo neanderthalensis* may have directly evolved. [1]

82 During which geologic epoch did the *Homo mauritanicus* species exist? [1]

Base your answers to questions 83 through 85 on the diagrams and tables below and on your knowledge of Earth science. Each diagram represents the Moon's orbital position and each table lists times of high and low tides and tide heights, in meters, at New York City for the date shown.

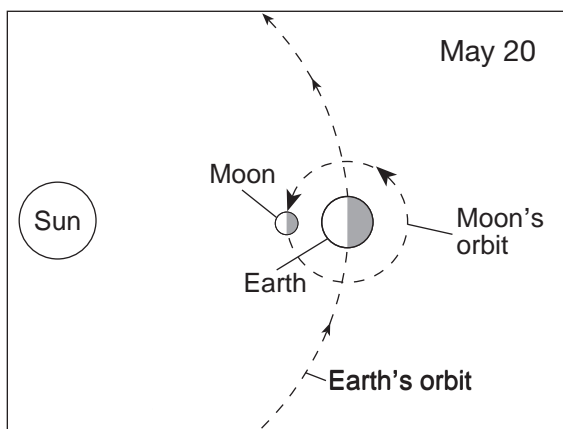
Moon's Orbital Position and Tide Data on May 13



(Not drawn to scale)

Tide	Time	Height (m)
high	12:59 a.m.	1.92
low	7:15 a.m.	0.37
high	1:32 p.m.	2.07
low	7:59 p.m.	0.27

Moon's Orbital Position and Tide Data on May 20



(Not drawn to scale)

Tide	Time	Height (m)
low	1:22 a.m.	0.06
high	7:50 a.m.	2.47
low	2:10 p.m.	0.09
high	8:10 p.m.	2.21

83 Determine the length of time between the two high tides shown for May 13. [1]

84 On the diagram *in your answer booklet*, shade the portion of the Moon that is in darkness to observers in New York City on May 13. [1]

85 On the diagram *in your answer booklet*, place an **X** on the Moon's orbit to represent the location of the Moon on May 28. [1]

PHYSICAL SETTING EARTH SCIENCE

Friday, June 19, 2015 — 9:15 a.m. to 12:15 p.m., only

ANSWER BOOKLET

Student Sex: Male
 Female
Teacher
School Grade

Record your answers for Part B–2 and Part C in this booklet.

Part B–2

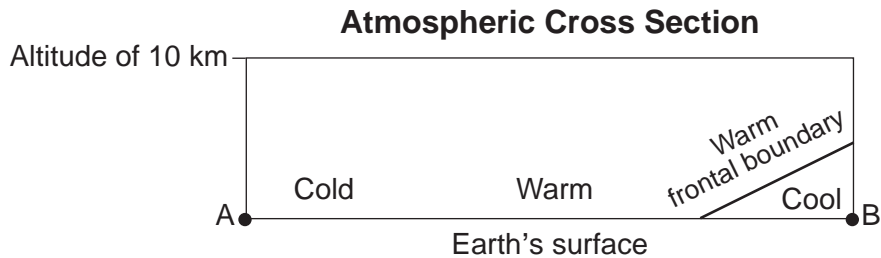
51 Glaciers: _____

Sea level: _____

52 Circle one: land ocean

Relative temperature of Earth's surface: _____

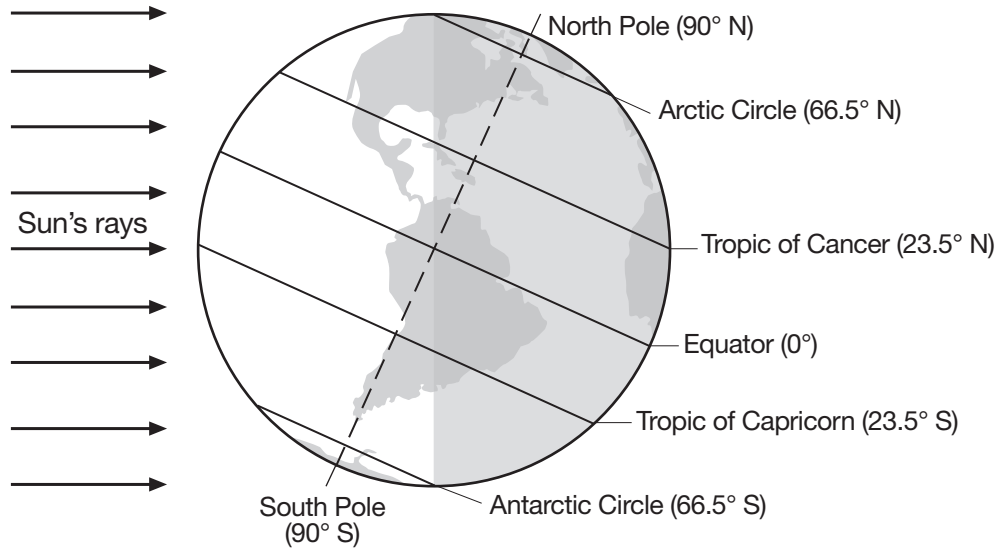
53



54 _____

55 _____ h

56

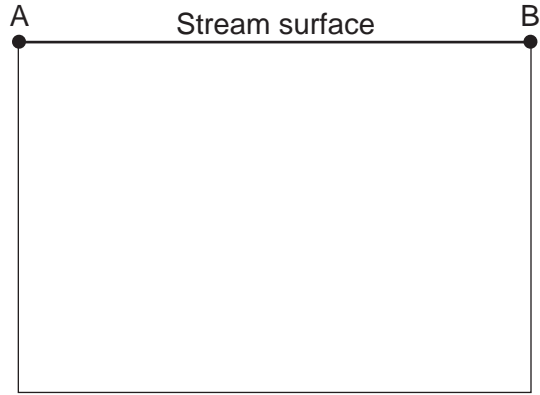


December 21

(Not drawn to scale)

57 _____ °

58



59 _____

60 _____

61 _____ and _____

62 _____ **C°/month**

63 _____

64 _____

65 _____ **Current**

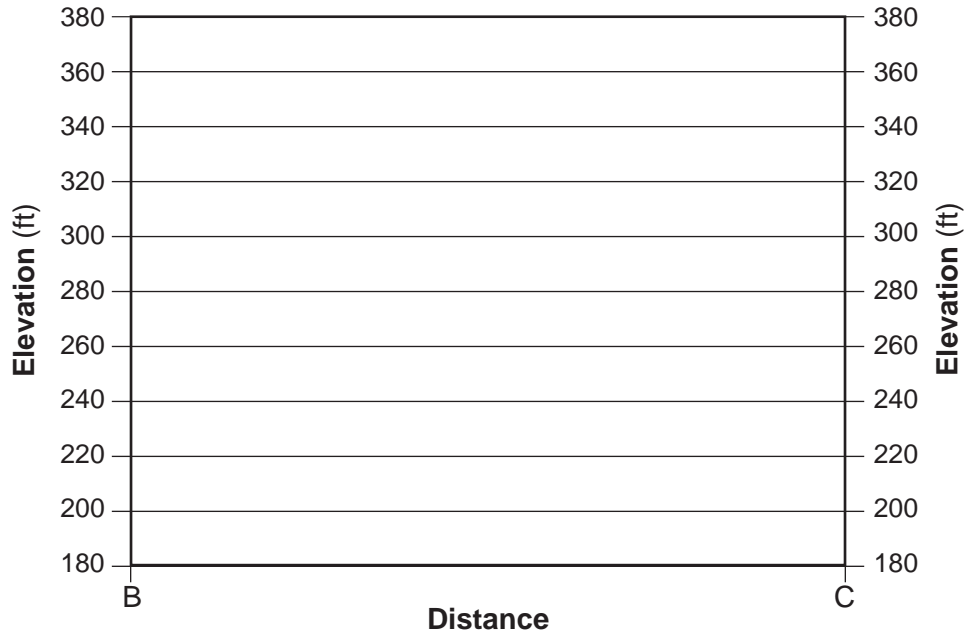
Part C

66 Air temperature at X: _____

Water vapor content at X: _____

67 _____ ft

68



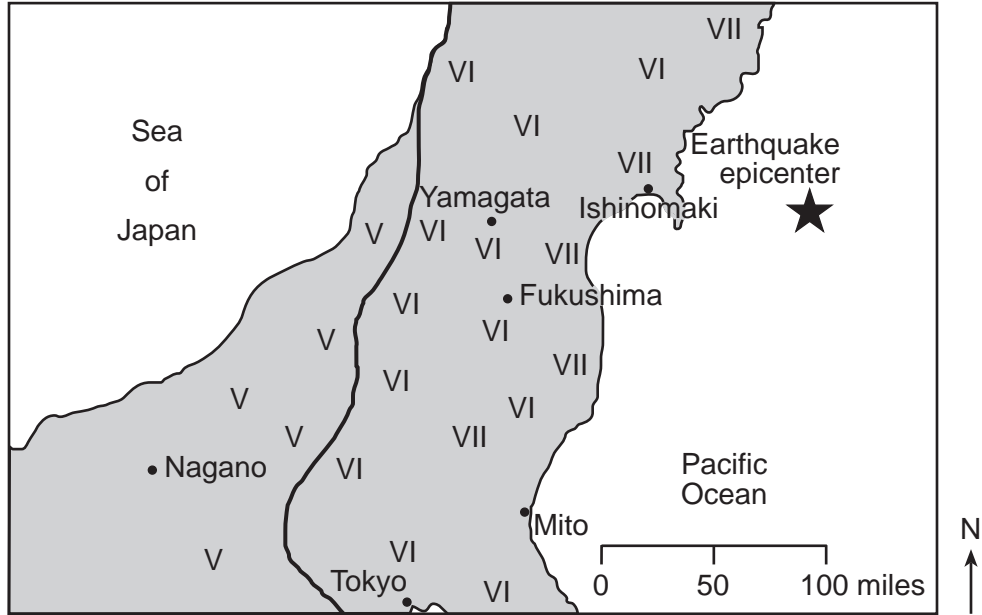
69 _____

70 _____

71 _____

72

March 11, 2011 Earthquake in Japan



73

- parked cars rock
- dishes and windows broken
- felt by all persons
- some heavy furniture moved
- chimneys and monuments fall
- buildings shifted off foundations

74 _____

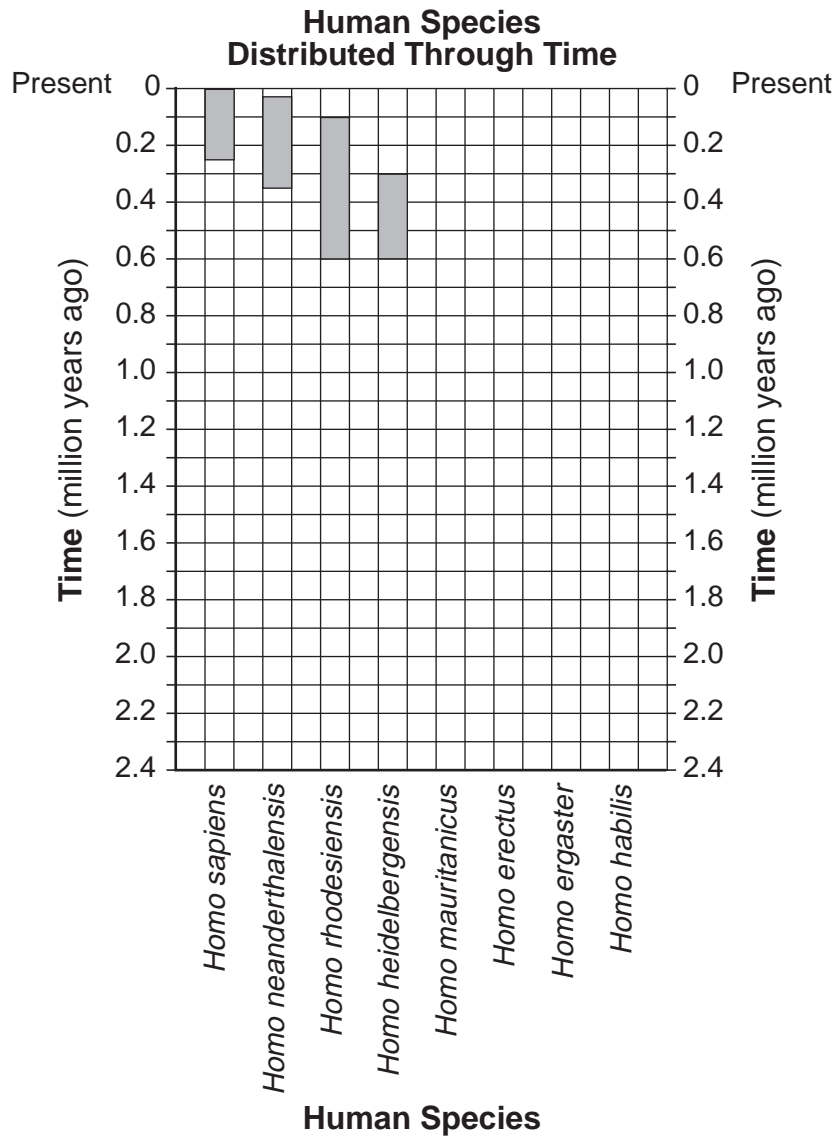
75 _____

76 _____

77 _____ months

78 _____

79



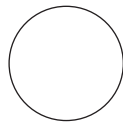
80 _____

81 *Homo* _____ and *Homo* _____

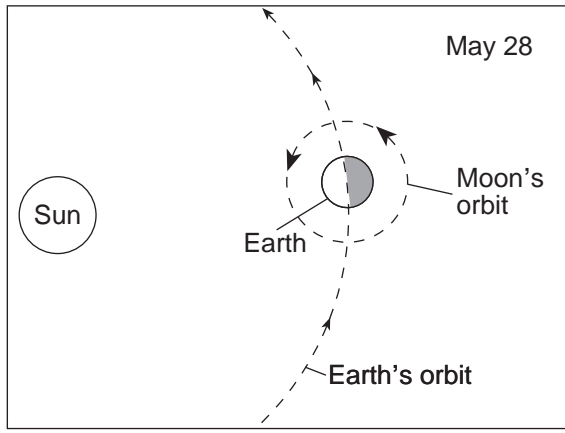
82 _____ Epoch

83 _____ h _____ min

84



85



(Not drawn to scale)

FOR TEACHERS ONLY

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

PHYSICAL SETTING/EARTH SCIENCE

Friday, June 19, 2015 — 9:15 a.m. to 12:15 p.m., only

SCORING KEY AND RATING GUIDE

Directions to the Teacher:

Refer to the directions on page 2 before rating student papers.

Updated information regarding the rating of this examination may be posted on the New York State Education Department's web site during the rating period. Check this web site at: <http://www.p12.nysed.gov/assessment/> and select the link "Scoring Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and several times throughout the Regents Examination period.

Part A and Part B-1

Allow 1 credit for each correct response.

Part A

1 1	10 2	19 1	28 2
2 2	11 3	20 2	29 1
3 2	12 2	21 4	30 4
4 1	13 1	22 4	31 2
5 3	14 3	23 2	32 1
6 4	15 4	24 1	33 4
7 1	16 4	25 3	34 1
8 2	17 3	26 2	35 3
9 4	18 4	27 3	

Part B-1

36 4	40 1	44 3	48 1
37 2	41 4	45 2	49 2
38 3	42 1	46 4	50 4
39 2	43 3	47 3	

Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Regents Examination in Physical Setting/Earth Science. Additional information about scoring is provided in the publication *Information Booklet for Scoring Regents Examinations in the Sciences*.

Do not attempt to correct the student's work by making insertions or changes of any kind. If the student's responses for the multiple-choice questions are being hand scored prior to being scanned, the scorer must be careful not to make any marks on the answer sheet except to record the scores in the designated score boxes. Marks elsewhere on the answer sheet will interfere with the accuracy of the scanning.

Allow 1 credit for each correct response.

At least two science teachers must participate in the scoring of the Part B–2 and Part C open-ended questions on a student's paper. Each of these teachers should be responsible for scoring a selected number of the open-ended questions on each answer paper. No one teacher is to score more than approximately one-half of the open-ended questions on a student's answer paper. Teachers may not score their own students' answer papers.

Students' responses must be scored strictly according to the Scoring Key and Rating Guide. For open-ended questions, credit may be allowed for responses other than those given in the rating guide if the response is a scientifically accurate answer to the question and demonstrates adequate knowledge as indicated by the examples in the rating guide. On the student's separate answer sheet, for each question, record the number of credits earned and the teacher's assigned rater/scorer letter.

Fractional credit is *not* allowed. Only whole-number credit may be given for a response. If the student gives more than one answer to a question, only the first answer should be rated. Units need not be given when the wording of the questions allows such omissions.

For hand scoring, raters should enter the scores earned in the appropriate boxes printed on the separate answer sheet. Next, the rater should add these scores and enter the total in the space provided. The student's score for the Earth Science Performance Test should be recorded in the space provided. Then the student's raw scores on the written test and the performance test should be converted to a scale score by using the conversion chart that will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Friday, June 19, 2015. The student's scale score should be entered in the box labeled "Scale Score" on the student's answer sheet. The scale score is the student's final examination score.

Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score.

51 [1] Allow 1 credit if *both* responses are correct. Acceptable responses include, but are not limited to:

Glaciers:

- will melt
- will retreat
- decrease in size
- become smaller
- shrink
- The rate of melting will increase.

Sea level:

- will rise
- increase
- higher
- coastal flooding

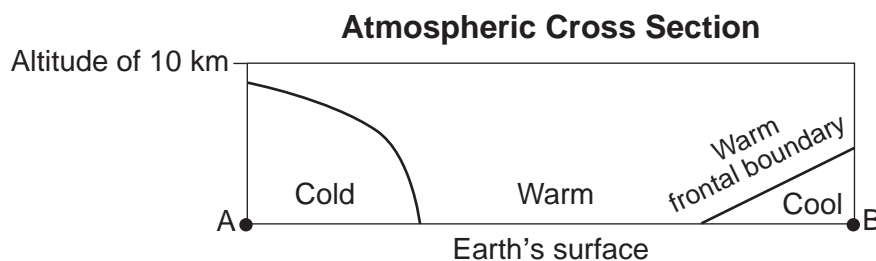
52 [1] Allow 1 credit for circling ocean *and* correctly describing the relative temperature of Earth's surface. Acceptable descriptions include, but are not limited to:

- warmer
- hot
- a tropical temperature

Note: Do *not* allow credit for a numerical answer because there are no temperatures indicated for comparison.

53 [1] Allow 1 credit for a line that starts from line AB, passes between the cold and warm labels, *and* curves up to the left.

Example of a 1-credit response:



54 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

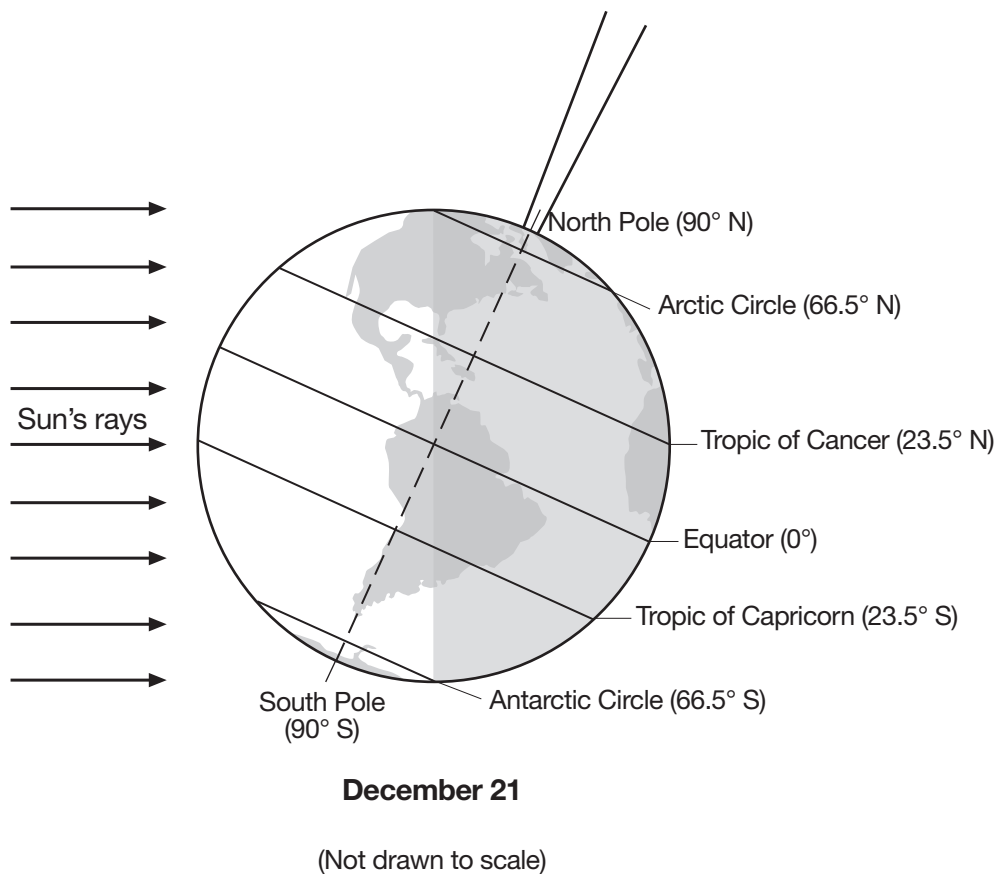
- rotation
- spinning/turning on its axis

Note: Do *not* allow credit for “Earth’s rotation around the Sun” because this confuses rotation with revolution.

55 [1] Allow 1 credit for a response that indicates 4 h.

56 [1] Allow 1 credit for an arrow within or touching the zone shown that points away from the North Pole and is generally aligned with Earth’s axis.

Note: Do *not* accept a line without an arrowhead because it does not show direction. It is recommended that an overlay of the same scale as the student answer booklet be used to ensure reliability in rating.

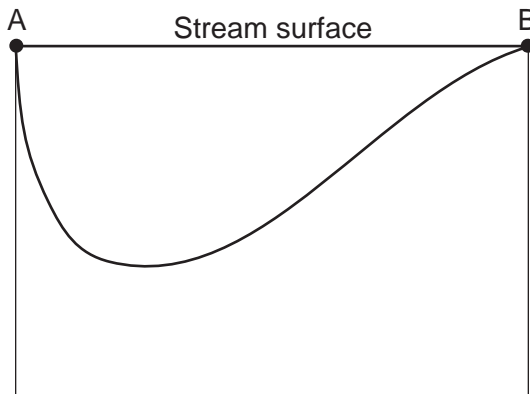


57 [1] Allow 1 credit for 44°.

Note: Do *not* allow credit if a compass direction is given (e.g., 44 N or 44° N) because that denotes latitude, *not* altitude.

- 58 [1] Allow 1 credit if the student's line is drawn from point A to point B and shows that the stream channel is deeper near side A.

Example of a 1-credit response:



- 59 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The particles were weathered by abrading with other particles.
 - Rolling and bouncing along the streambed breaks off corners and polishes rocks.
 - The sediments scrape against the streambed.
 - They rub against one another.
 - abrasion
 - weathering due to collision of particles

Note: Do *not* allow credit for water *or* erosion, acting alone, to smooth rocks because this is restating the question, and water alone, without sediments, does not abrade rock.

- 60 [1] Allow 1 credit for delta *or* any specific type of delta.

- 61 [1] Allow 1 credit for *two* correct responses. Acceptable responses include, but are not limited to:
- stream velocity/speed
 - gradient/slope of the stream
 - location within a meander/stream channel
 - volume/amount of stream discharge
 - shape of stream channel (straight vs. meandering)
 - water depth
 - material found in the stream or along the streambed (vegetation, trees, sediments)
 - type of bedrock
 - particle size/shape/density

62 [1] Allow 1 credit for $8\text{C}^\circ/\text{month}$ *or* $-8\text{C}^\circ/\text{mo}$.

63 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Omaha is surrounded by land, which has a low specific heat.
- The Pacific Ocean moderates the temperature/climate of Eureka.
- Large bodies of water change temperature more slowly than land does.
- Water has a higher specific heat than land.
- The relatively drier air around Omaha has a lower specific heat than the moist air around Eureka.

Note: Do *not* allow credit for “Eureka is closer to water so temperatures remain constant” because this just restates the question without explaining the role that water plays in causing constant temperatures.

64 [1] Allow 1 credit for January *or* Jan.

65 [1] Allow 1 credit for California Current.

Part C

66 [1] Allow 1 credit if *both* responses are correct. Acceptable responses include, but are not limited to:

Air temperature at *X*:

- cooler
- lower/less
- decreased
- colder than *Y*

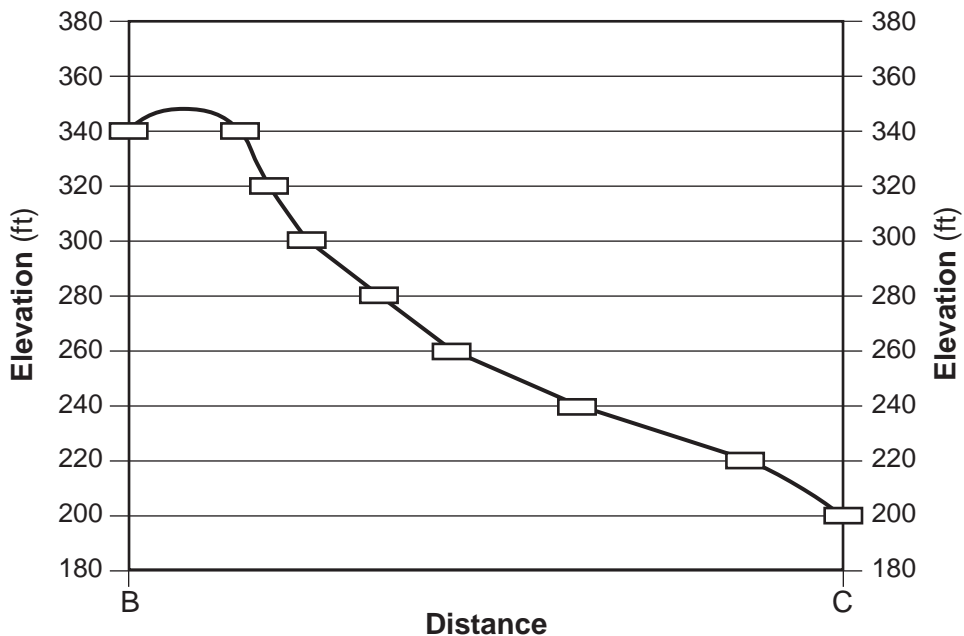
Water vapor content at *X*:

- higher/more
- 100% relative humidity
- wetter
- saturated
- more humid than *Y*

67 [1] Allow 1 credit for 300 ft.

68 [1] Allow 1 credit if the centers of *all nine* plots are within or touch the rectangles shown and are correctly connected with a line that passes within or touches the rectangles. The line must show a hill higher than 340 feet but lower than 360 feet.

Note: It is recommended that an overlay of the same scale as the student answer booklet be used to ensure reliability in rating.



69 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Contour lines bend upstream when they cross Coe Creek.
- Contour line elevations decrease toward the northeast along Coe Creek.
- The V shapes of the contour lines point upstream toward higher elevations.
- Lower elevations are toward the northeast.
- Contour lines make V-shapes that point southwest.
- The contour lines are bending in the opposite direction.

Note: Do *not* allow credit for “water flows downhill” because this does not indicate how contour lines show stream direction.

70 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Contour lines between *D* and *E* are closer together.
- Contour lines between *F* and *G* are farther apart, indicating a slower stream velocity.
- Contour lines that are closer together indicate a steeper slope/gradient.
- There is a greater elevation change between *D* and *E*.

Note: Do *not* allow credit for “*D* and *E* are closer” because *F* and *G* are the same distance apart. Do *not* allow credit for “the slope or gradient is steeper” alone because this does not indicate how contour lines show a steeper slope.

71 [1] Allow 1 credit for any value from 38 to 42 with acceptable units. Acceptable units include, but are not limited to:

- ft/mi
- feet/mi
- feet/mile

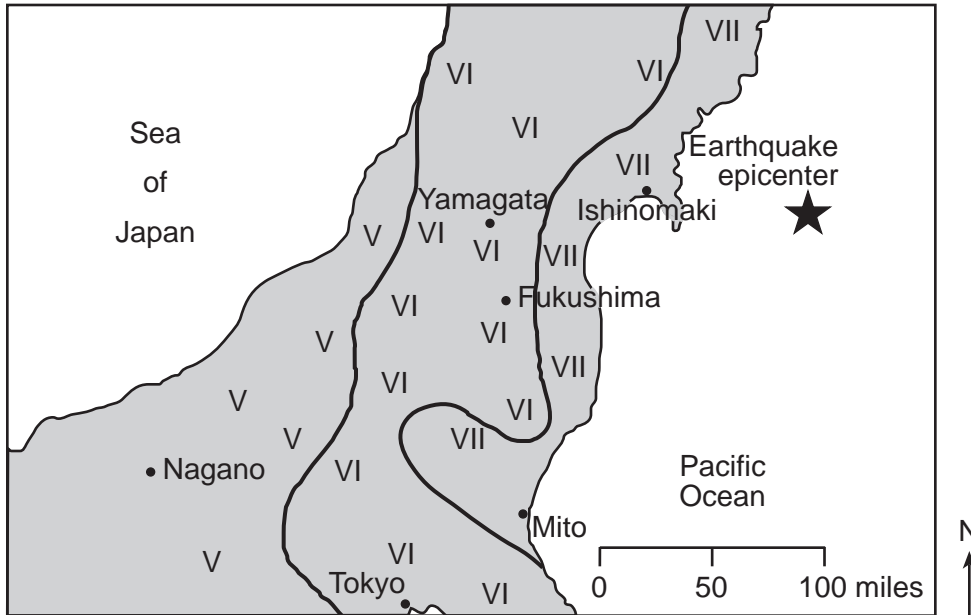
72 [1] Allow 1 credit for any acceptable line separating all values of VI from VII.

Note: Allow credit even if the line passes through water.

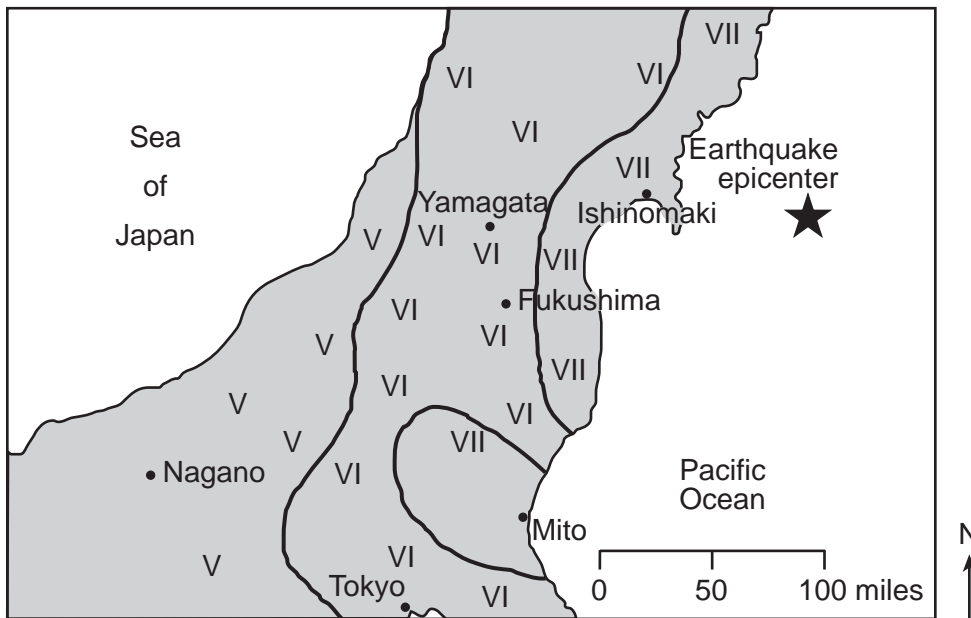
Do *not* allow credit if the line touches or passes through any Mercalli value.

Examples of 1-credit responses:

March 11, 2011 Earthquake in Japan



March 11, 2011 Earthquake in Japan



73 [1] Allow 1 credit if only the first four boxes are checked as shown below.

√	parked cars rock
√	dishes and windows broken
√	felt by all persons
√	some heavy furniture moved
	chimneys and monuments fall
	buildings shifted off foundations

Note: Allow credit if a symbol other than a check mark is used.

74 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- convergent boundary
- subduction zone

75 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- *P*-waves arrived earlier at Ishinomaki than at Nagano.
- The difference in arrival times was less at Ishinomaki.
- The *P*-wave and *S*-wave arrival time interval was greater at Nagano.
- The amplitude/magnitude of seismic waves was greater/bigger/stronger at Ishinomaki.
- There is less time difference between the *P*- and *S*-waves at the closer location.
- *P*- and *S*-waves were closer together.

76 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- install a tsunami monitoring and warning system
- build a seawall/barricade/barrier
- build tall structures on stronger foundations
- designate or plan evacuation routes
- prepare emergency kits/supplies
- relocate buildings to higher ground

Note: Do *not* allow credit for an action indicating an imminent tsunami (e.g., evacuate to higher ground).

77 [1] Allow 1 credit for 6 *or* six months.

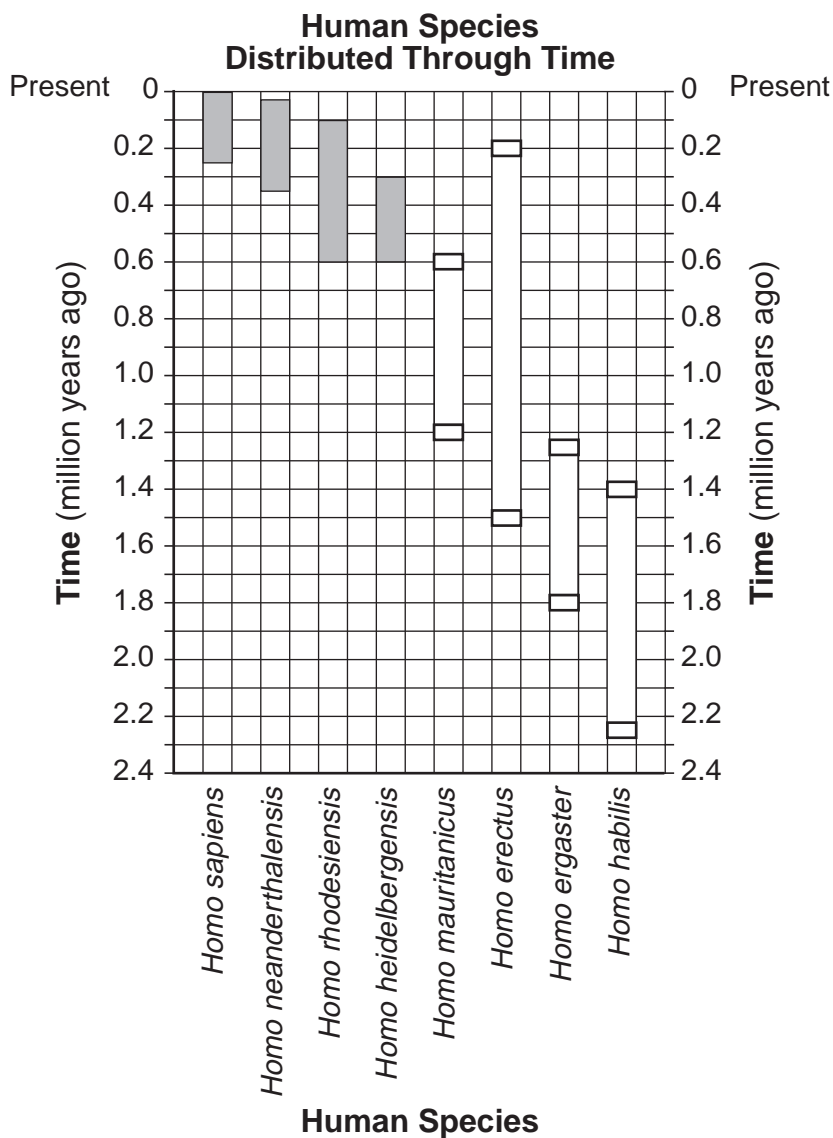
78 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- New York State is receiving higher angles of insolation.
- The Northern Hemisphere is experiencing a longer duration of insolation.
- The North Pole axis or Northern Hemisphere is tilted toward the Sun.
- The Sun appears higher in the sky.

Note: Do *not* allow credit for “Earth is tilted toward the Sun” because only the Northern Hemisphere is tilted toward the Sun.

Do *not* allow credit for “the Northern Hemisphere faces the Sun” because part of the Southern Hemisphere also faces the Sun during the daylight hours.

79 [1] Allow 1 credit if *all four* bars are drawn in the correct columns and the ends of the bars are within or touch the rectangular areas shown at the end of each bar.



Note: It is recommended that an overlay of the same scale as the student answer booklet be used to ensure reliability in rating.

80 [1] Allow 1 credit for *Homo habilis* or *habilis* or *H. habilis*.

81 [1] Allow 1 credit for *two* correct species from the list below.

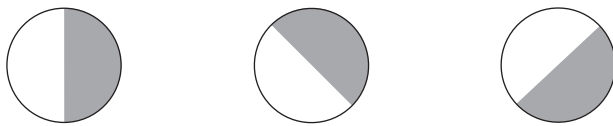
- *Homo rhodesiensis*
- *Homo heidelbergensis*
- *Homo erectus*

82 [1] Allow 1 credit for Pleistocene Epoch.

83 [1] Allow 1 credit for 12 h 33 min.

84 [1] Allow 1 credit if the student shades the right half of the Moon to show a last-quarter-Moon phase as shown below.

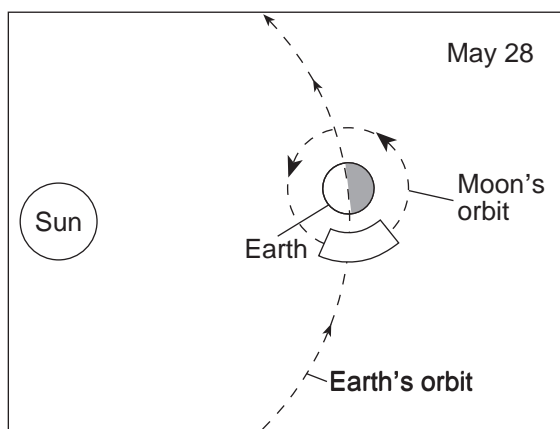
Examples of 1-credit responses:



85 [1] Allow 1 credit if the center of the **X** falls within or touches the band in the Moon's orbit shown below.

Note: Allow credit if a symbol other than an **X** is used.

It is recommended that an overlay of the same scale as the student answer booklet be used to ensure reliability in rating.



(Not drawn to scale)

Regents Examination in Physical Setting/Earth Science

June 2015

Chart for Converting Total Test Raw Scores to Final Examination Scores (Scale Scores)

The *Chart for Determining the Final Examination Score for the June 2015 Regents Examination in Physical Setting/Earth Science* will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Friday, June 19, 2015. Conversion charts provided for previous administrations of the Regents Examination in Physical Setting/Earth Science must NOT be used to determine students' final scores for this administration.

Online Submission of Teacher Evaluations of the Test to the Department

Suggestions and feedback from teachers provide an important contribution to the test development process. The Department provides an online evaluation form for State assessments. It contains spaces for teachers to respond to several specific questions and to make suggestions. Instructions for completing the evaluation form are as follows:

1. Go to <http://www.forms2.nysed.gov/emsc/osa/exameval/reexameval.cfm>.
2. Select the test title.
3. Complete the required demographic fields.
4. Complete each evaluation question and provide comments in the space provided.
5. Click the **SUBMIT** button at the bottom of the page to submit the completed form.

Map to Core Curriculum

June 2015 Physical Setting/Earth Science			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1	6		68, 71, 77
Math Key Idea 2	11, 14, 21, 30	41, 48, 50, 62, 64	75, 78, 79, 80, 84
Math Key Idea 3	5, 28	55, 57	67, 70, 72, 81
Science Inquiry Key Idea 1	12, 15, 17, 18, 19, 20, 24, 33, 34	37, 42, 43, 45, 52, 53, 56, 59, 61, 63	66, 85
Science Inquiry Key Idea 2	1, 21	58	
Science Inquiry Key Idea 3	1, 5, 6, 7, 8, 9, 10, 11, 13, 14, 18, 22, 23, 24, 25, 31, 32, 33, 34, 35	37, 41, 44, 45, 49, 50, 52, 53, 57, 62, 63, 65	71, 74, 75, 80
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1		36	
Key Idea 2			
Key Idea 3		36	
Standard 6			
Key Idea 1	25, 27, 29, 31, 32	39, 42, 43, 46, 51, 52, 54, 58, 60, 61	69
Key Idea 2	3, 6, 8, 9, 13, 16, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 31, 32, 35	36, 37, 39, 40, 43, 44, 45, 46, 47, 48, 49, 50, 53, 54, 55, 56, 58, 60, 63, 65	66, 67, 68, 69, 70, 72, 74, 82, 83, 84, 85
Key Idea 3	10, 18	41	67, 73
Key Idea 4			
Key Idea 5	3, 7, 16, 22, 26	36, 40, 51, 54, 59, 61, 63	82, 83, 84
Key Idea 6			
Standard 7			
Key Idea 1			79
Key Idea 2			76
Standard 4			
Key Idea 1	1, 2, 3, 4, 5, 18, 19, 20, 21, 22, 23, 25, 26	39, 40, 41, 42, 46, 49, 54, 55, 56, 57	77, 78, 79, 80, 81, 82, 83, 84, 85
Key Idea 2	6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 24, 27, 28, 29, 30	36, 37, 38, 43, 44, 50, 51, 52, 53, 58, 59, 60, 61, 62, 63, 64, 65	66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76
Key Idea 3	31, 32, 33, 34, 35	45, 47, 48	
Reference Tables			
ESRT 2011 Edition (Revised)	1, 5, 6, 7, 8, 9, 10, 11, 13, 14, 18, 23, 24, 25, 31, 32, 33, 34, 35	37, 41, 44, 45, 49, 50, 52, 53, 57, 62, 63, 65	71, 74, 75, 80

The State Education Department / The University of the State of New York
Regents Examination in Physical Setting/Earth Science – June 2015
Chart for Converting Total Test Raw Scores to Final Examination Scores (Scale Scores)
(Not to be used for the Braille Edition)

To determine the student's final score, locate the student's Total Performance Test Score across the top of the chart and the Total Written Test Score down the side of the chart. The point where the two scores intersect is the student's final examination score. For example, a student receiving a Total Performance Test Score of 10 and Total Written Test Score of 66 would receive a final examination score of 85.

		Total Performance Test Score																
		16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Total Written Test Score	85	100	99	99	99	98	98	97	96	96	95	94	93	91	90	88	87	85
	84	99	99	98	98	98	97	96	96	95	94	93	92	91	89	88	86	84
	83	99	99	98	98	98	97	96	96	95	94	93	92	91	89	88	86	84
	82	98	98	98	97	97	96	95	95	94	93	92	91	90	88	87	85	83
	81	98	98	98	97	97	96	95	95	94	93	92	91	90	88	87	85	83
	80	97	97	97	96	96	95	95	94	93	92	91	90	89	88	86	84	82
	79	97	96	96	95	95	94	94	93	92	91	90	89	88	87	85	83	82
	78	97	96	96	95	95	94	94	93	92	91	90	89	88	87	85	83	82
	77	96	95	95	95	94	94	93	92	91	91	89	88	87	86	84	83	81
	76	95	95	94	94	93	93	92	91	91	90	89	88	86	85	83	82	80
	75	94	94	93	93	92	92	91	90	90	89	88	87	86	84	83	81	79
	74	94	94	93	93	92	92	91	90	90	89	88	87	86	84	83	81	79
	73	93	93	92	92	92	91	90	90	89	88	87	86	85	83	82	80	78
	72	92	92	92	91	91	90	90	89	88	87	86	85	84	82	81	79	77
	71	92	92	92	91	91	90	90	89	88	87	86	85	84	82	81	79	77
	70	92	91	91	90	90	89	89	88	87	86	85	84	83	82	80	78	77
	69	91	90	90	89	89	88	88	87	86	85	84	83	82	81	79	77	76
	68	90	90	89	89	88	88	87	86	85	85	84	82	81	80	78	77	75
	67	89	89	88	88	87	87	86	85	85	84	83	82	80	79	77	76	74
	66	88	88	87	87	86	86	85	85	84	83	82	81	80	78	77	75	73
65	88	88	87	87	86	86	85	85	84	83	82	81	80	78	77	75	73	
64	87	87	87	86	86	85	84	84	83	82	81	80	79	77	76	74	72	
63	86	86	86	85	85	84	84	83	82	81	80	79	78	77	75	73	71	
62	86	85	85	84	84	83	83	82	81	80	79	78	77	76	74	72	71	
61	85	84	84	84	83	82	82	81	80	79	78	77	76	75	73	72	70	
60	84	84	83	83	82	82	81	80	80	79	78	77	75	74	72	71	69	
59	83	83	82	82	81	81	80	79	79	78	77	76	74	73	71	70	68	
58	82	82	81	81	81	80	79	79	78	77	76	75	74	72	71	69	67	
57	81	81	81	80	80	79	78	78	77	76	75	74	73	71	70	68	66	
56	80	80	80	79	79	78	78	77	76	75	74	73	72	71	69	67	65	
55	80	79	79	78	78	77	77	76	75	74	73	72	71	70	68	66	65	
54	79	78	78	78	77	77	76	75	74	74	72	71	70	69	67	66	64	
53	78	78	77	77	76	76	75	74	74	73	72	71	69	68	66	65	63	
52	77	77	76	76	75	75	74	73	73	72	71	70	69	67	66	64	62	
51	76	76	75	75	75	74	73	73	72	71	70	69	68	66	65	63	61	
50	75	75	75	74	74	73	73	72	71	70	69	68	67	65	64	62	60	
49	75	74	74	73	73	72	72	71	70	69	68	67	66	65	63	61	60	
48	74	73	73	72	72	71	71	70	69	68	67	66	65	64	62	60	59	
47	73	73	72	72	71	71	70	69	68	68	67	65	64	63	61	60	58	
46	72	72	71	71	70	70	69	68	68	67	66	65	63	62	60	59	57	
45	71	71	70	70	69	69	68	68	67	66	65	64	63	61	60	58	56	

**Final Examination Scores
 Regents Examination in Physical Setting/Earth Science – June 2015 – continued**

		Total Performance Test Score																
		16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Total Written Test Score	44	70	70	70	69	69	68	67	67	66	65	64	63	62	60	59	57	55
	43	69	69	69	68	68	67	67	66	65	64	63	62	61	60	58	56	54
	42	68	67	67	67	66	65	65	64	63	62	61	60	59	58	56	55	53
	41	67	67	66	66	65	65	64	63	63	62	61	60	58	57	55	54	52
	40	66	66	65	65	64	64	63	62	62	61	60	59	57	56	54	53	51
	39	65	65	64	64	64	63	62	62	61	60	59	58	57	55	54	52	50
	38	64	64	64	63	63	62	61	61	60	59	58	57	56	54	53	51	49
	37	63	62	62	61	61	60	60	59	58	57	56	55	54	53	51	49	48
	36	62	61	61	61	60	60	59	58	57	57	55	54	53	52	50	49	47
	35	61	61	60	60	59	59	58	57	57	56	55	54	52	51	49	48	46
	34	60	60	59	59	58	58	57	56	56	55	54	53	52	50	49	47	45
	33	58	58	58	57	57	56	56	55	54	53	52	51	50	48	47	45	43
	32	58	57	57	56	56	55	55	54	53	52	51	50	49	48	46	44	43
	31	57	56	56	55	55	54	54	53	52	51	50	49	48	47	45	43	42
	30	55	55	54	54	53	53	52	51	51	50	49	48	46	45	43	42	40
	29	54	54	53	53	52	52	51	51	50	49	48	47	46	44	43	41	39
	28	53	53	53	52	52	51	50	50	49	48	47	46	45	43	42	40	38
	27	52	51	51	50	50	49	49	48	47	46	45	44	43	42	40	38	37
	26	51	50	50	50	49	48	48	47	46	45	44	43	42	41	39	38	36
	25	49	49	48	48	47	47	46	45	45	44	43	42	40	39	37	36	34
	24	48	48	47	47	47	46	45	45	44	43	42	41	40	38	37	35	33
	23	46	46	46	45	45	44	44	43	42	41	40	39	38	37	35	33	31
	22	46	45	45	44	44	43	43	42	41	40	39	38	37	36	34	32	31
	21	44	44	43	43	42	42	41	40	40	39	38	37	35	34	32	31	29
	20	43	43	42	42	41	41	40	39	39	38	37	36	35	33	32	30	28
19	41	41	41	40	40	39	39	38	37	36	35	34	33	31	30	28	26	
18	41	40	40	39	39	38	38	37	36	35	34	33	32	31	29	27	26	
17	39	39	38	38	37	37	36	35	34	34	33	31	30	29	27	26	24	
16	38	38	37	37	36	36	35	34	34	33	32	31	29	28	26	25	23	
15	36	36	36	35	35	34	33	33	32	31	30	29	28	26	25	23	21	
14	35	35	35	34	34	33	33	32	31	30	29	28	27	26	24	22	20	
13	34	33	33	33	32	31	31	30	29	28	27	26	25	24	22	21	19	
12	32	32	31	31	30	30	29	28	28	27	26	25	23	22	20	19	17	
11	31	31	30	30	30	29	28	28	27	26	25	24	23	21	20	18	16	
10	29	29	29	28	28	27	27	26	25	24	23	22	21	20	18	16	14	
9	28	27	27	27	26	26	25	24	23	23	21	20	19	18	16	15	13	
8	27	27	26	26	25	25	24	23	23	22	21	20	18	17	15	14	12	
7	25	25	24	24	24	23	22	22	21	20	19	18	17	15	14	12	10	
6	24	23	23	22	22	21	21	20	19	18	17	16	15	14	12	10	9	
5	23	22	22	21	21	20	20	19	18	17	16	15	14	13	11	9	8	
4	21	21	20	20	19	19	18	17	17	16	15	14	12	11	9	8	6	
3	19	19	19	18	18	17	16	16	16	15	14	13	11	9	8	6	4	
2	18	18	18	17	17	16	16	15	14	13	12	11	10	9	7	5	3	
1	17	16	16	16	15	14	14	13	12	11	10	9	8	7	5	4	2	
0	15	15	14	14	13	13	12	11	11	10	9	8	6	5	3	2	0	