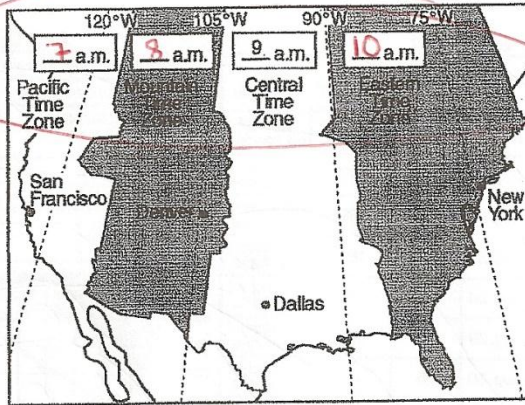
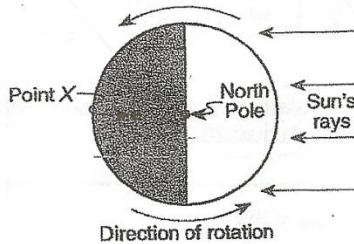


KEY 2012-2013

- 827) On the United States time zone map provided below, indicate the standard time in each time zone when it is 9 a.m. in the Central Time Zone. The dashed lines represent the standard-time meridians for each time zone. [Be sure to indicate the time for all three zones.]



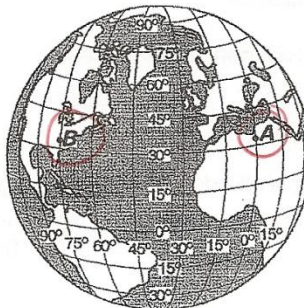
- 159) The diagram below represents the direction of Earth's rotation as it appears from above the North Pole. Point X is a location on Earth's surface.



The time at point X is closest to

- A) 9 p.m.
 B) 12 midnight
 C) 12 noon
 D) 9 a.m.

- 918) The diagram below shows the latitude-longitude grid on an Earth model. Points A and B are locations on the surface.



Handwritten calculation:
 $75 - 0 = 75$
 $75 / 15^\circ/\text{hr} = 5$
 5 hrs

On Earth, the solar time difference between point A and point B would be

- A) 24 hours
 B) 12 hours
 C) 1 hour
 D) 5 hours

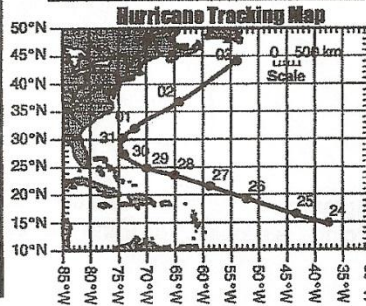
On the Hurricane Tracking Map below, Table I below represents the storm track data for an Atlantic hurricane. Location, wind velocity, air pressure, and storm strength are shown for the storm's center at 3 p.m. Greenwich time each day. Table II shows a scale of relative storm strength. The map shows the hurricane's path.

Data Table I

| Latitude (°N) | Longitude (°W) | Date | Wind Velocity (knots) | Air Pressure (millibars) | Storm Strength |
|---------------|----------------|----------|-----------------------|--------------------------|----------------------|
| 14 | 37 | Aug. 24 | 30 | 1,006 | Tropical depression |
| 16 | 44 | Aug. 25 | 70 | 987 | Category-1 hurricane |
| 19 | 52 | Aug. 26 | 90 | 970 | Category-2 hurricane |
| 21 | 59 | Aug. 27 | 80 | 997 | Category-1 hurricane |
| 23 | 65 | Aug. 28 | 80 | 988 | Category-1 hurricane |
| 25 | 70 | Aug. 29 | 80 | 988 | Category-1 hurricane |
| 27 | 73 | Aug. 30 | 65 | 988 | Category-1 hurricane |
| 30 | 74 | Aug. 31 | 85 | 976 | Category-2 hurricane |
| 32 | 72 | Sept. 01 | 85 | 968 | Category-2 hurricane |
| 37 | 64 | Sept. 02 | 70 | 975 | Category-1 hurricane |
| 44 | 53 | Sept. 03 | 65 | 955 | Category-1 hurricane |

Data Table II

| Storm Strength Scale | Relative Strength |
|----------------------|---------------------------|
| Tropical depression | WEAKEST ↓ STRONGEST |
| Tropical storm | |
| Category 1 | |
| Category 2 | |
| Category 3 | |
| Category 4 | |
| Category 5 | |



- 639) In the table below, calculate the average daily rate of movement of the hurricane during the period from 3 p.m. August 24 to 3 p.m. August 28.

| | |
|---|------------------|
| a | rate of change = |
| b | rate of change = |
| c | rate of change = |

- (a) Write the equation used to determine the rate of change.
 (b) Substitute data into the equation.
 (c) Calculate the rate and label it with the proper units.

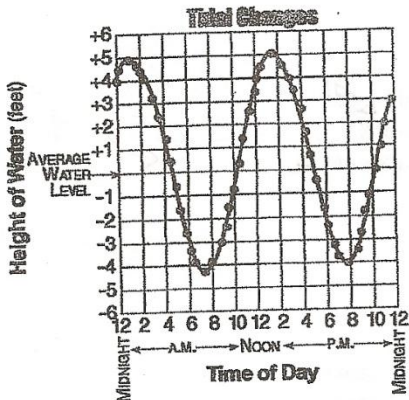
$$\frac{3000 \text{ km}}{4 \text{ days}} = 750 \text{ km/day}$$

- 124) At which location will the highest altitude of the star Polaris be observed?

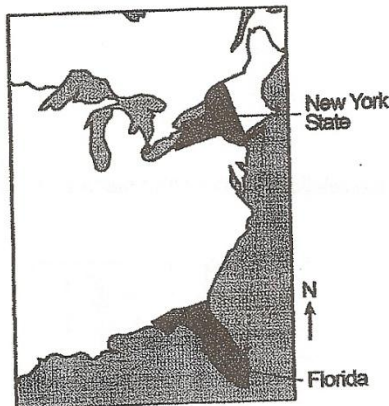
A) central United States 25°N
 B) Equator 0°

C) Arctic Circle 66.5°N
 D) Tropic of Cancer 23.5°N

The graph below shows the recorded change in water level (ocean tides) at a coastal city in the northeastern United States during 1 day.



- 382) According to the pattern shown on the given graph, the next high tide will occur on the following day at approximately
- A) 3:15 a.m. B) 12:30 a.m. C) 2:00 a.m. D) 4:00 a.m.
- 383) Which inference about tides is *best* made from the given graph?
- A) The hourly rate of tidal change is always the same.
 B) The tidal change is cyclic.
 C) The rate of tidal change is greatest at high tide.
 D) The tidal change is a random event.
- 884) The dashed line on the map below shows a ship's route from Long Island, New York, to Florida. As the ship travels south, the star Polaris appears lower in the northern sky each night.



- The *best* explanation for this observation is that Polaris
- A) is located directly over Earth's Equator
 B) is located directly over Earth's North Pole
 C) rises and sets at different locations each day
 D) has an elliptical orbit around Earth

Figure A

1. Label the contour lines in this picture
2. What is the elevation range of X? $30+10=40-1=39ft$
3. What is the maximum elevation of X? $39ft$

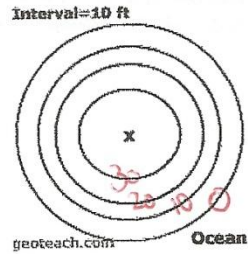


FIGURE A

Figure B

1. Label the contour lines in this picture
2. What is the name of the type of contour line with the little marks inside of it? depression
3. What is the elevation range of X? 21-39
4. What is the lowest elevation of point X? 31

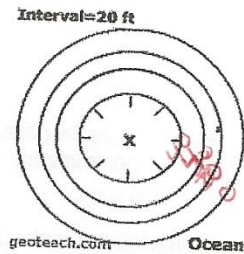


FIGURE B

Figure C

1. Name the direction where you would find the steepest slope? East
2. Gentlest slope? West
3. How did you make that determination? contour line distance.

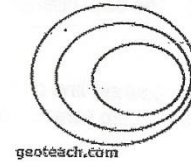
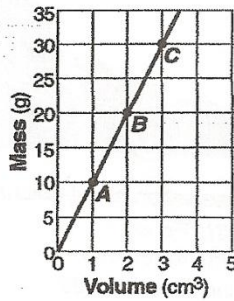


FIGURE C

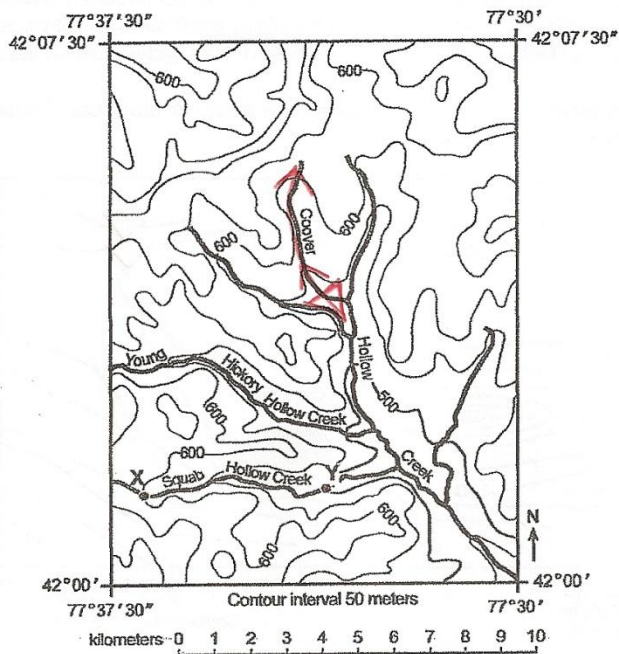
506) The graph below shows the relationship between mass and volume for three samples, A, B, and C, of a given material.



What is the density of this material?

- A) 10.0 g/cm³ B) 5.0 g/cm³ C) 1.0 g/cm³ D) 20.0 g/cm³

The topographic map below is of an area in New York State. Points X and Y are locations on Squab Hollow Creek.



- 427) Describe *one* way to determine the direction of flow of Coover Hollow Creek from information shown on the map.

opposite the "V" S or SE

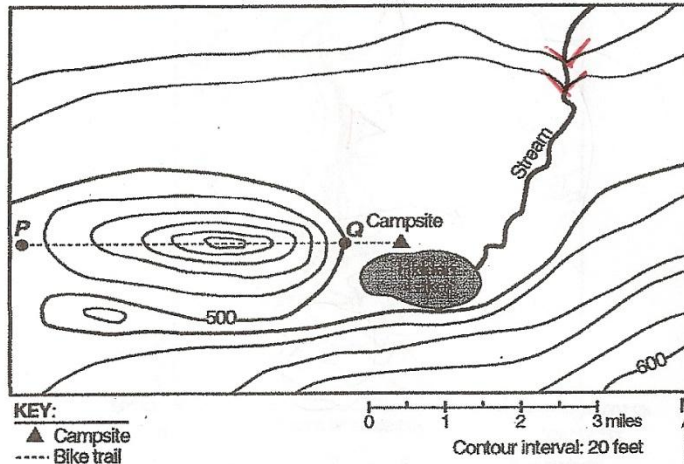
- 428) In the space below, determine the gradient of Squab Hollow Creek between point X and point Y by following the directions below.

- Using the Earth Science Reference Tables, write the equation used to determine the gradient.
- Substitute values into the equation.
- Solve the equation and label the answer with the correct units.

$$\frac{600 - 500}{5 \text{ km}} = 20 \text{ m/km}$$

A group of Earth Science students decided to take an adventurous camping trip, so they rode bicycles to a New York State park that was located in an isolated area. They traveled up a steep hill. When they reached the top, they looked at the landscape and noticed a lake at the bottom of the hill. They named it Hidden Lake. To the left of Hidden Lake was a large field with a small stream. They decided to set up their campsite in the field near Hidden Lake. To get to the field, they cycled down a very steep slope.

The map below shows the location of the bicycle trail and the students' campsite. Points P and Q are reference points on the map.

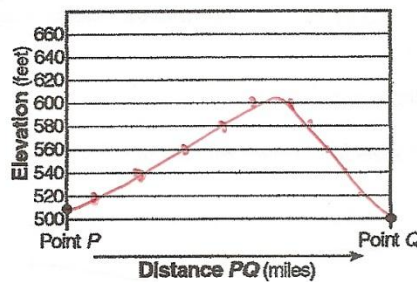


- 5) State the evidence shown on the given map that indicates that the area directly north of Hidden Lake is relatively flat.

the lines are far apart.

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- 6) On the grid below, draw a profile of the landscape along the bicycle trail from point P to point Q by following the directions below.

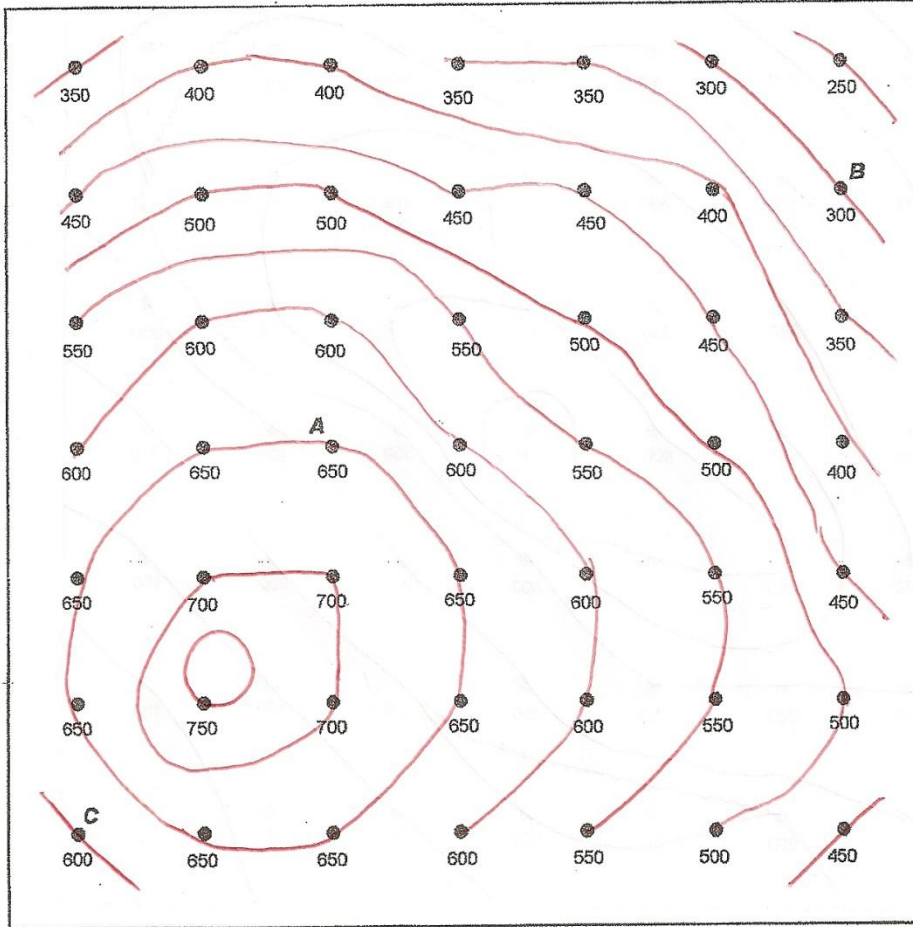


- (a) State the general compass direction in which the stream is flowing in the given map. *North*
- (b) State how contour lines provide the evidence for determining this direction.

opposite the "V"

Contour Lines Practice #1

Draw in contour lines at the following elevations (all numbers are given in feet above sea level):
250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750



Calculate the gradient from point A to point B

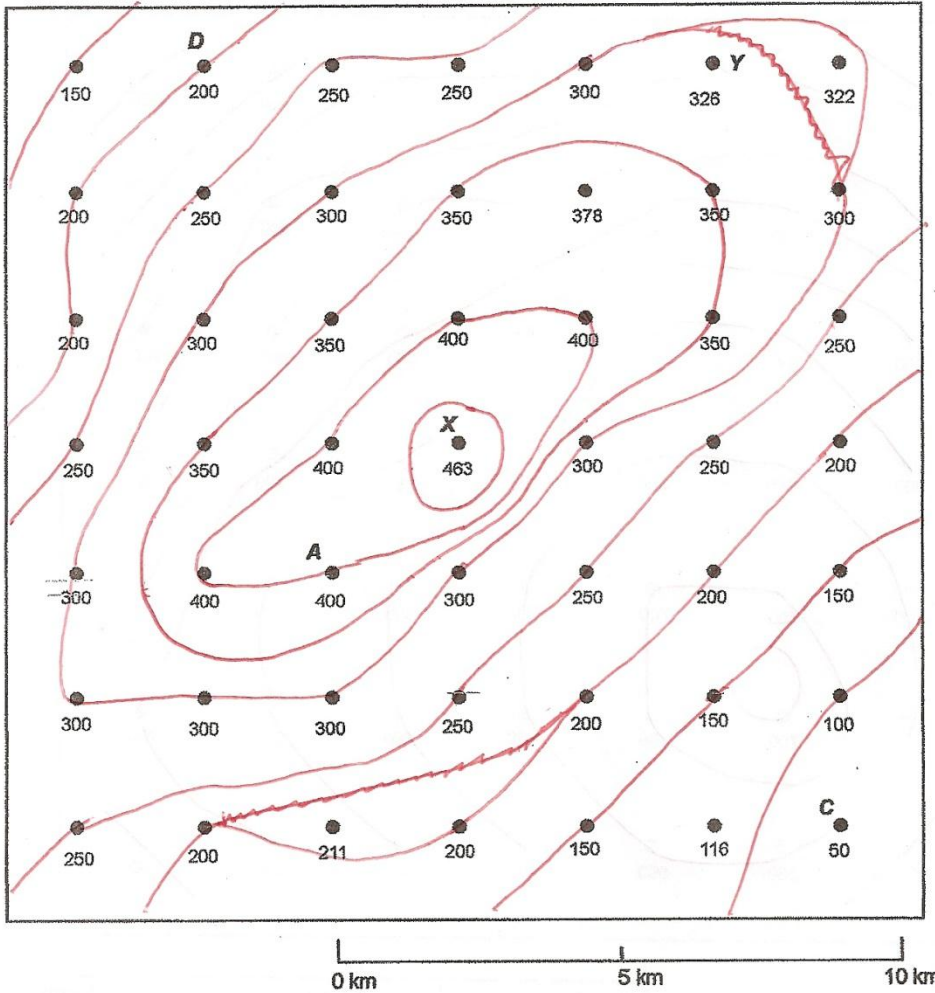
$$\frac{650 - 300}{10} = \frac{350}{10} = 35 \text{ ft/km}$$

If you cut through the land from C to B, what would the cross section look like? Draw it. (This is called a PROFILE.)



Contour Lines Practice #2

Draw in contour lines at the following elevations (all numbers are given in feet above sea level):
450, 400, 350, 300, 250, 200, 150, 100, 50



Calculate the gradient from point X to point Y

$$\frac{463 - 326}{8} = 17.1 \text{ ft/km}$$

Calculate the gradient from point X to point C

$$\frac{463 - 50}{9} = 45.9 \text{ ft/km}$$

If you cut through the land from C to D, what would the cross section look like? Draw it. (This is called a PROFILE.)

