Name:

Measuring Earth NOTES

OBJECTIVES

Correctly define: isolines, gradient, topographic map, contour interval, hachured lines, profile, latitude, longitude, hydrosphere, lithosphere, atmosphere, elevation, model

EARTH'S SPHERES

Identify the three spheres of the Earth.

TOPOGRAPHIC MAPS

Calculate the contour interval on an unmarked map.

Determine the elevation of every point on a topographic map.

Determine the direction of flow of a river or stream on a topographic map.

Accurately calculate the distance between two locations in miles or kilometers.

Draw a profile between two points on a topographic map.

GRADIENT

Determine the gradient between two points on a topographic map.

Calculate the temperature gradient between two points on an isotherm map.

LATITUDE AND LONGITUDE

Identify the means by which latitude and longitude were created and the science upon which they are based.

Calculate the latitude and longitude of any point on the Earth's surface.

Determine the latitude and longitude of all major cities in NY State based on the map in the Earth Science Reference Tables.

Determine the latitude and longitude of all continents based on the map in the Earth Science Reference Tables.

Determine the altitude of Polaris for any location in the Northern Hemisphere.

Vocabulary

Atmosphere: _____

_____

Contour Interval: _____

_____

Contour Line: _____

_____

Elevation: _____

_____

Gradient: _____

_____

Hachured Lines: _____

_____

Hydrosphere: _____

_____

Latitude: _____

_____

Lithosphere: _____

_____

Longitude: _____

_____

Model: _____

_____

Profile: _____

_____

Key Concepts & Questions

Earth's Spheres

Information regarding Earth's atmosphere can be found on page _____ of the ESRTs

Information regarding Earth's interior can be found on page _____ of the ESRTs

Information regarding Earth's hydrosphere can be found on page _____ of the ESRTs

QUESTIONS:

1. At a depth of 2500 kilometers, what is the inferred temperature and pressure?

        a. temperature: _____   b. pressure: _____

2. By volume, what element makes up the greatest percentage of the Earth's lithosphere? _____

3. At a height of 50 miles above the Earth's surface, what is the temperature? _____

4. At a height of 50 kilometers above the Earth's surface, what is the temperature? _____

5. How many kilometers above the Earth's surface is the interface of the troposphere and stratosphere? _____
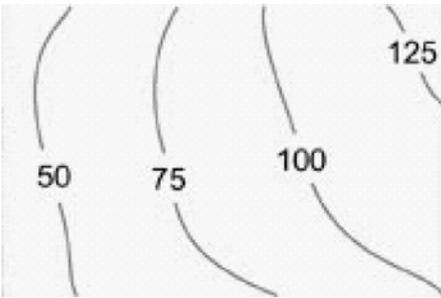
Topographic Maps
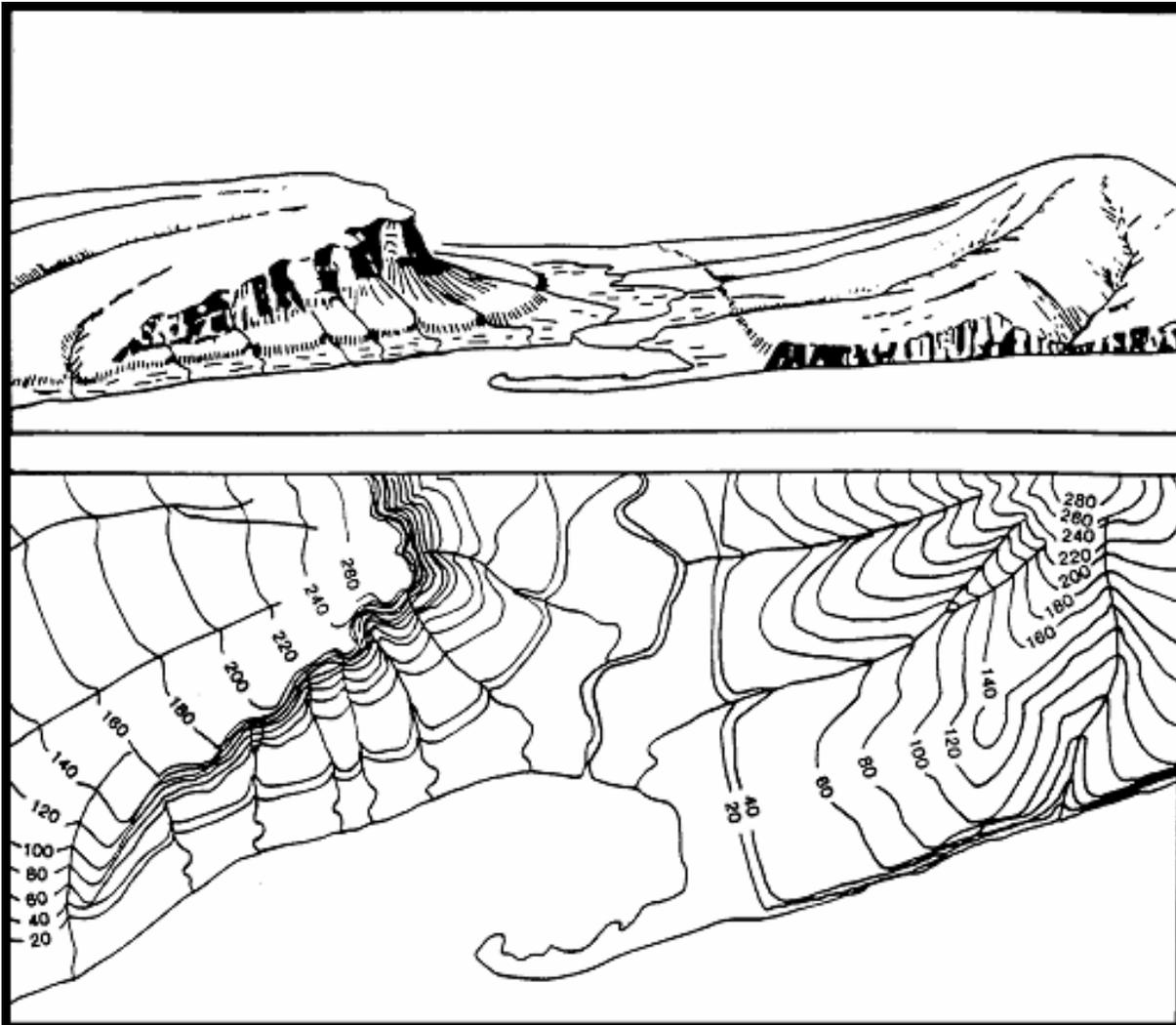
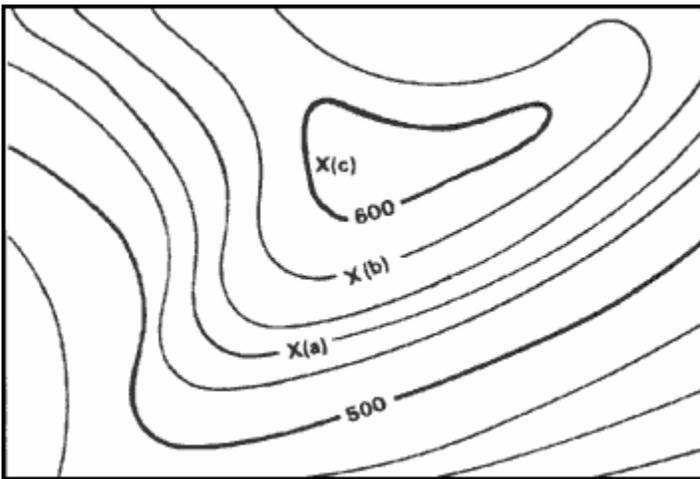What is the purpose of a topographic map? What does it show?

Who uses topographic maps?

When might someone use a topographic map?

Topographic Maps---Contour Intervals
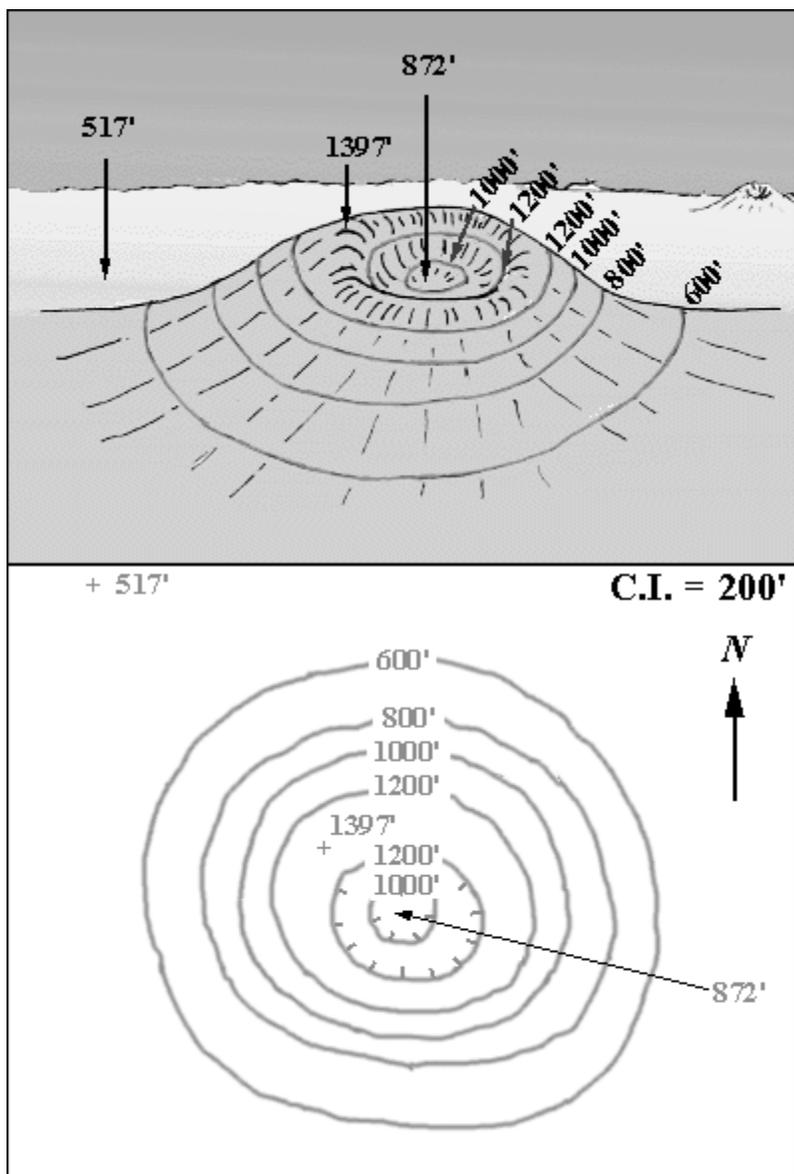

What is the contour interval of this map? _____

What is the contour interval on this map? _____

What is the elevation of points (a) and (b)? a: _____ b._____

What is the maximum possible elevation of (c)? _____
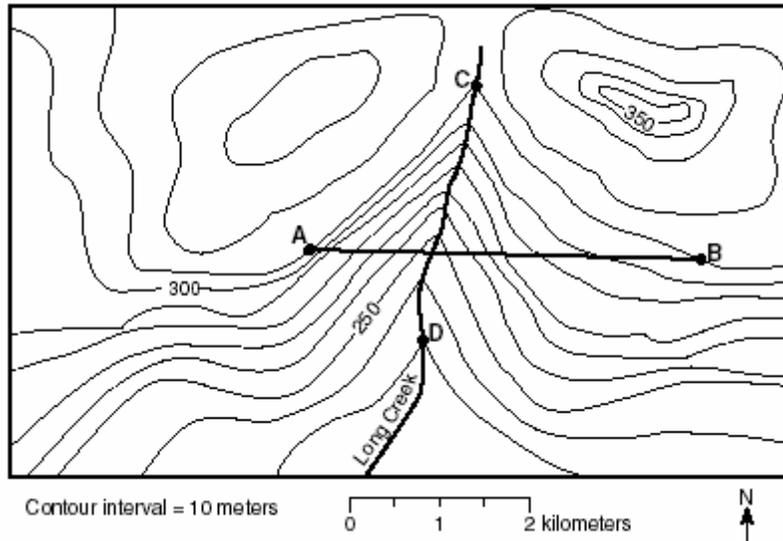
Topographic Maps---Hachured Lines

What do hachured lines show?

What are the rules concerning hachured lines?

Topographic Maps---Stream Flow

What you must know: When a contour line crosses a river, stream or creek, the contour line forms a "V". The "V" always points *__upstream__*.

Contour interval = 10 meters   0   1   2 kilometers   N

If North is at the top of the page, what direction is Long Creek flowing? _____

Can a river flow north? _____

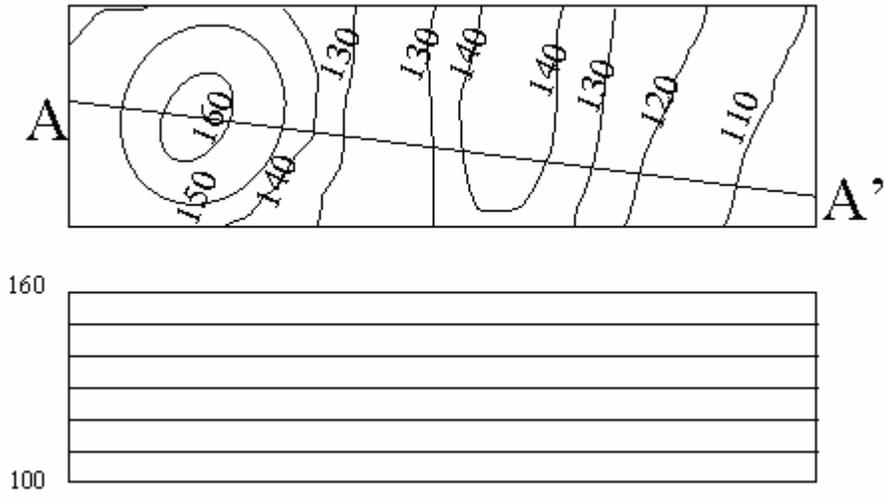Name two ways that you can determine which way a river flows on a topographic map.

Topographic Maps---Profiles

What are the steps to draw a topographic profile?

1. _____

2. _____

3. _____

4. _____

Using the map and chart below, construct a topographic map profile.

Topographic Profile

Please match the contour map on the left with the profile on the right.

1
2
3
4
5
6

A
B
C
D
E
F

Topographic Maps---Distance Between Points

What is the distance, in kilometers, from Kingston to Oswego? _____

What is the distance, in miles, from Plattsburgh to Jamestown? _____

Gradient =

The elevation of Albany is 282 feet. The elevation at Binghamton is 1634 feet. Calculate the gradient to the *nearest tenth of a ft/mi*. **Show all work.**

The elevation of Watertown is 99m. The elevation at Oswego is 144m. Calculate the gradient to the *nearest tenth of a m/km*. **Show all work.**

Temperature Gradients

Surface Temperature
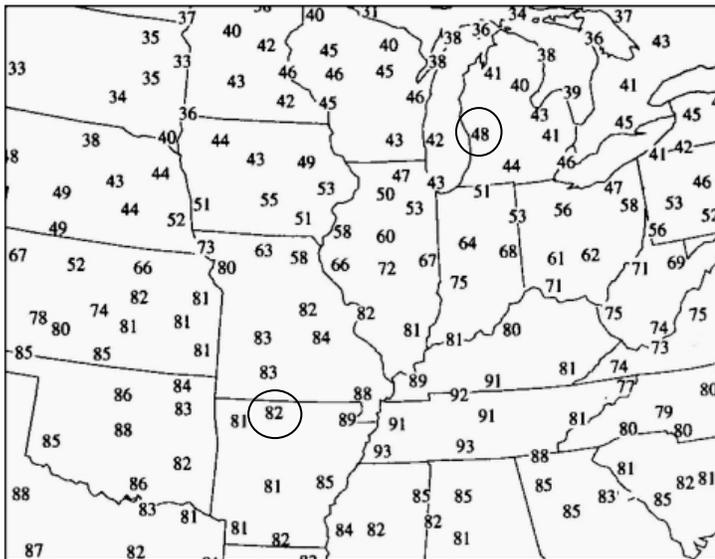
If the distance between the two circled cities is 425 km, calculate the gradient to the *nearest hundredth.*. **Show all work including the appropriate units.**

Latitude & Longitude

How are latitude & longitude measured?

Latitude is measured _____ and _____ from the _____.

Longitude is measured _____ and _____ from the _____.

On the coordinate system below, plot the following sets of coordinates:

A: {25°N, 100°W}   B: {30°S, 100°E}   C: {80°S, 65°W)   D: {45°N, 105°E}
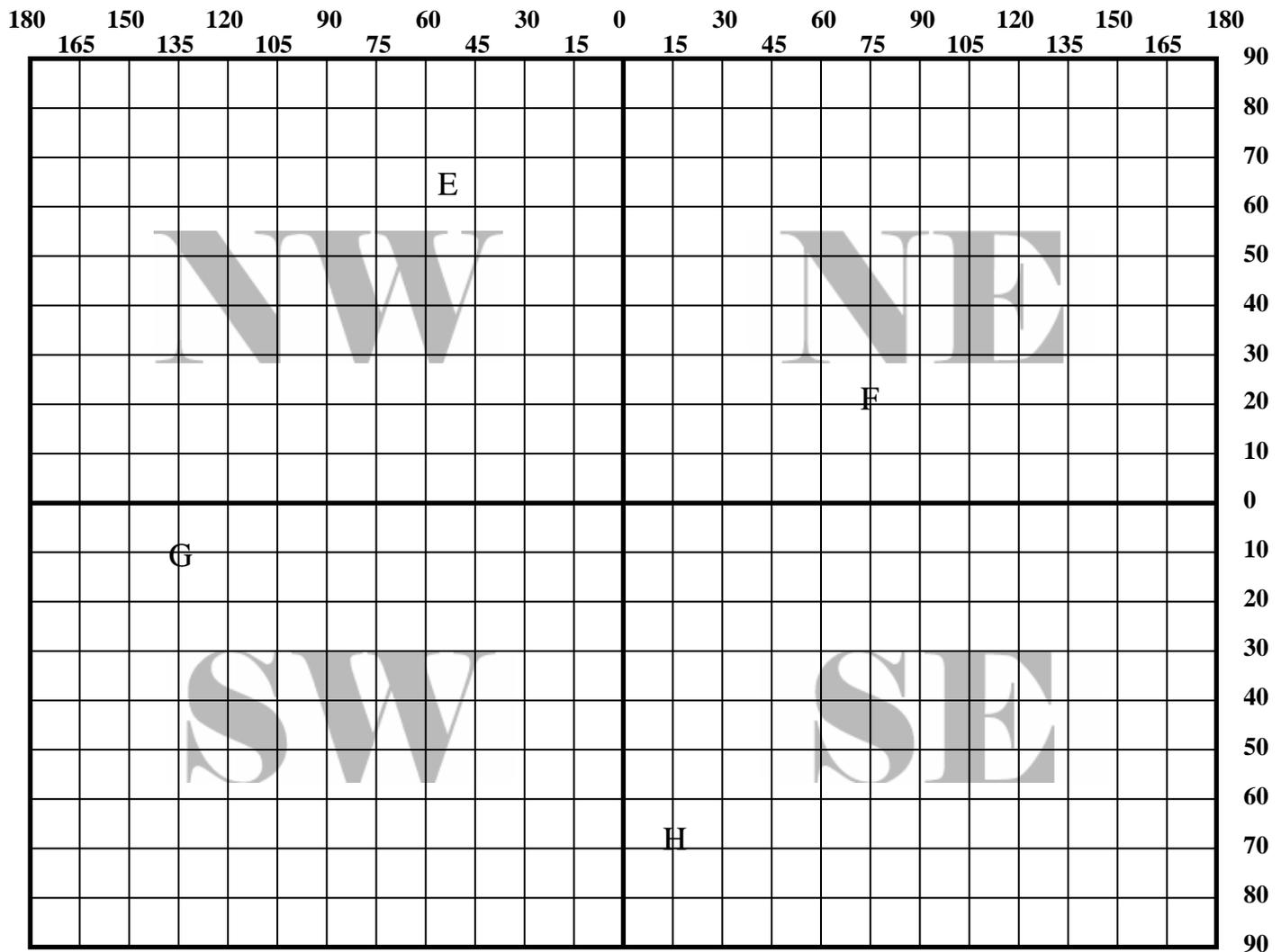
State the coordinates for each of the letters in the figure above:

E: _____, _____   F: _____, _____   G: _____, _____   H: _____, _____

All locations in the United States have a (North, South) latitude and (East, West) longitude.

Latitude:

Based on the _____ of _____

LATITUDE = _____

Polaris can only be seen in the _____ Hemisphere!

For each location below, determine the altitude of Polaris:

Location	Altitude of Polaris
25°N, 100°W	
30°S, 100°E	
80°S, 65°W	
45°N, 105°E	

Longitude:

Based on Earth's _____.

Each hour the Earth rotates _____°

How many time zones are there? _____ Time zones are spaced _____° apart.

People on the same line of longitude have the same _____.

> **Example: Two students record a difference in local time of two hours. How many degrees of longitude apart are they?**