

**Short Answer**

1. The shortest line on an ellipsoid surface is called a(n) \_\_\_\_\_ and is shaped like a(n) \_\_\_\_\_.
2. The \_\_\_\_\_ is the angle between the ellipsoidal normal and vertical line at a point.
3. How many UTM Zones cover Wisconsin? \_\_\_\_\_ SPC Zones? \_\_\_\_\_.

**Problem (1)**

Station *Long*, PID QN0259, is an NSRS First Order horizontal control point in Washburn County. When it was originally monumented in 1922 an Azimuth Mark was also set and the direction between them measured. Using the information on *Long's* data sheet, along with any other resources, determine the Washburn County Coordinate System grid azimuth from *Long* to its Azimuth Mark.

**Problem (2)**

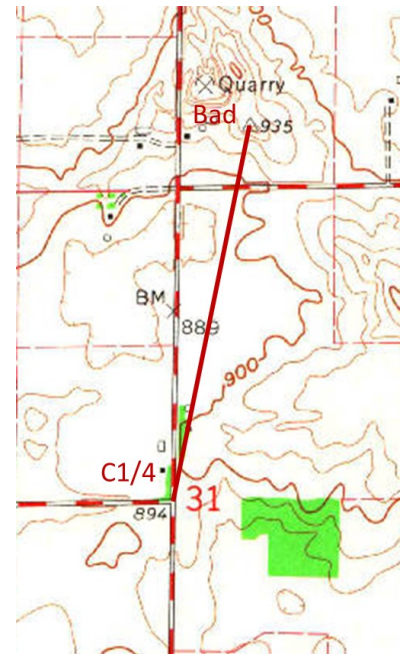
Station *Bad*, PID NH1307, is a Third Order horizontal control point in Dane County. The horizontal distance from it to the Center Quarter corner of Sec 31 is measured as 3215.67 ft. The partial topoquad shows the line; the contour interval is 10 ft.

**Part (A)**

Determine the line's grid length in the Wis South State Plane Coordinate System. Is it significantly different from the measured horizontal distance?

**Part (B)**

Determine the line's grid length in the Dane County Coordinate System. Is it significantly different from the measured horizontal distance?

**Problem (3)**

NSRS Stations *Mollette Lake* (AB508) and *Deer Farm* (AB8436) are located in Burnett County. What is the Burnett County Coordinate System grid distance between them?