Arctic Circle 2016

You are visiting the north pole to collect data from sensors in monitoring stations located around the pole. The sensors record data on: carbon dioxide level, cloud cover, cosmic rays, ice depth, precipitation, seismic events, snowdrift height, temperature, wildlife activity, and wind speed.

Stations are located on lines that head out from the pole at various angles (as labeled on the polar graph paper on page 2). Each station is placed a specified distance from the pole and contains either one or two sensors.

Each double-outlined box on page 2 lists all of the stations located on one of the lines leading from the pole. Each cell in a boxed group provides the information for one station: its distance from the pole and the sensor(s) it holds. Each kind of sensor is identified by a symbol: α β δ θ λ μ ξ π ϕ ψ.

After you figure out where the sensors are, you collect data from them. You walk ten paths, one for each kind of sensor. When walking between sensors, you always travel straight to the closest unread sensor of the current kind. When you are done with all ten paths, you realize that your tracks in the snow between sensors make an interesting pattern.

Use the statements below to match sensors with symbols and figure out the angles for the lines of stations.

1. There are no stations at 0° or 60°.
2. There are five stations with two different kinds of sensors. They are at 45°, 195°, 225°, 300°, and 345°.
3. Both precipitation sensors are at 30°.
4. The only sensors at 15° and 105° are for wildlife activity.
5. The line at 195° has five different kinds of sensors.
6. One of the three sensors at 210° is for cloud cover.
7. There is a snowdrift height sensor sixteen meters from the pole at 270°.
8. There are three stations, each with a different kind of sensor, at 315°.
9. A sensor for cosmic rays is the only sensor at 330°.
10. The two temperature sensors are at the same distance from the pole, 30° apart.
11. Two of the four cloud cover sensors share a station with another kind of sensor. Those shared stations are 30° apart.
12. Your path for the snowdrift height sensors starts six meters from the pole, at 255°.
13. Your path for the seismic event sensors starts at a shared station. Each sensor you visit is at an angle greater than the previous sensor, and your path ends at another shared station, 180° from the start.
14. There are three ice depth sensors. The middle one on your path is at a shared station.
15. You start your path for the seismic event sensors at the one closest to the pole, and the next seven sensors on that path get progressively farther from the pole.
16. The cloud cover sensor farthest from the pole is the first one on your path.
17. One of your sensor paths starts at 90°. The second sensor on that path is one meter farther from the pole, at a different angle.
18. Your path for the wind speed sensors starts at the closest (to the pole) of the three stations at 300°.

By Cathy Saxton

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3	7	9	16	18
ϕ	α	α	λ	λ

4	13
α	θ

4	27
α	θ

5
α

6
β

8
α

6	8
α	αθ

6	22
α	θ

8
αδ

11
θ

30
θ

3	5	8	19
ϕ	α	λ	λ

4	14	21	29
α	λ	ξπ	θ

4	5	6	17
ψ	ψ	α	θ

5	8	15
β	α	δ

6	13	19
λ	λ	λ

7	8	9
μ	μ	α

8	11	17
αδ	δ	δ

10	14	17
α	δ	δ

13	22	31
λ	ξ	θ

15	24	31
ξ	π	θ

17	22	25
λ	π	θπ