

2023A11**PERCENTAGES AND GRAPHING**

Level 1: You were provided with a sample of wind data for your local area. The data included wind direction information. The dataset was as follows (where N is 0°, E is 90°, S is 180°, and W is 270°):

- 80 hours from the North
- 120 hours from the Northeast
- 45 hours from the Northwest
- 60 hours from the East
- 30 hours from the West
- 90 hours from the Southeast
- 50 hours from the Southwest
- 0 hours from the South

Calculate the distribution of wind for each wind direction.

To solve this problem, we can start by splitting a circle into sectors based on direction. Where 0° = North, 90° = East, 180° = South, 270° = West.

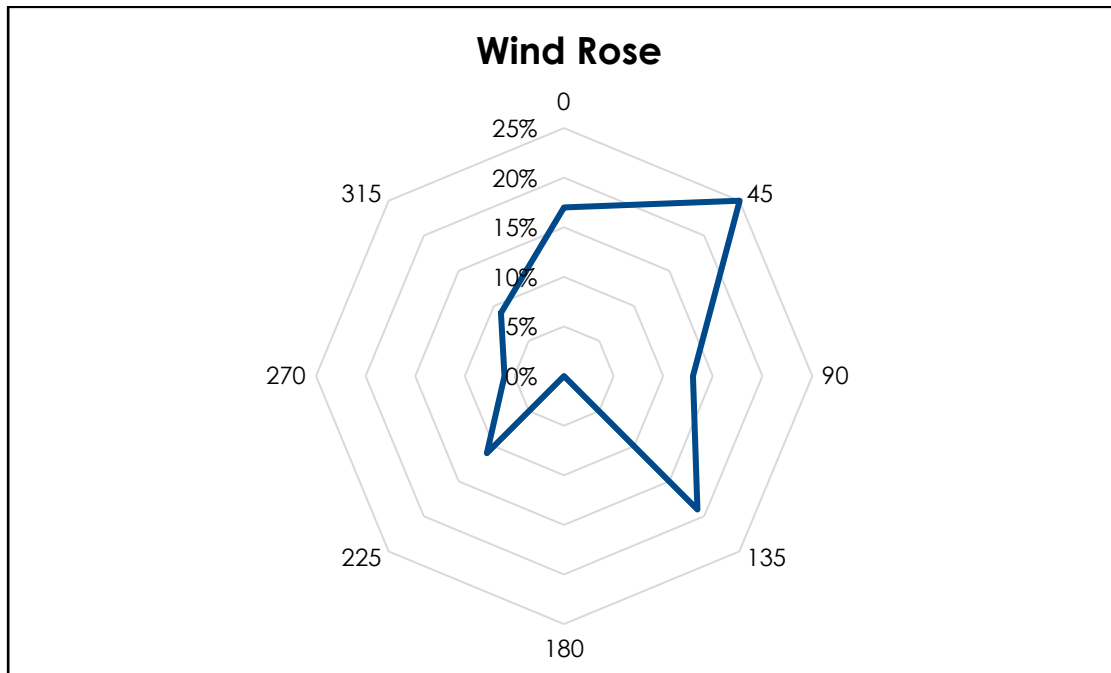
Probability of wind blowing from North:

$$\% N = \frac{\text{Hours from } N}{\text{Sum of all hours}} = \frac{80 \text{ hours}}{(80+120+60+90+50+30+45)\text{hours}} = 17\%$$

Once you calculate the distribution of wind for each wind direction, you should have a table that looks like this:

DIRECTION	HOURS	PROBABILITY
0 (N)	80	17%
45 (NE)	120	25%
90 (E)	60	13%
135 (SE)	90	19%
180 (S)	0	0%
225 (SW)	50	11%
270 (W)	30	6%
315 (NW)	45	9%

Level 2: Your wind rose map should look something like the image below.



This wind rose looks different from the example on the question page. A wind rose's shape will vary based on the amount of wind from each direction over a period of time. This wind rose was made using a small sample of data versus a whole year of data, so the differences between wind directions are more noticeable.