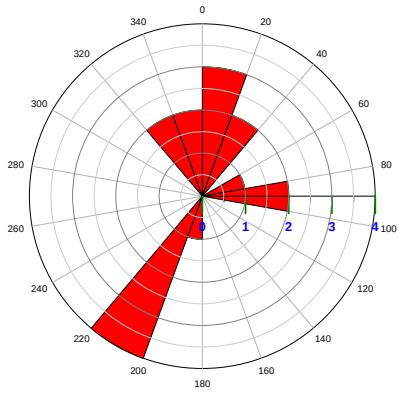
ES302 Introduction to Polar Plots / Rose Diagrams for Azimuthal Data

Rose diagrams circular frequency histograms that are used for directional (azimuthal) data. Examples of these types of data include strikes of bedding, wind direction, or ocean current directions. An example is shown below:



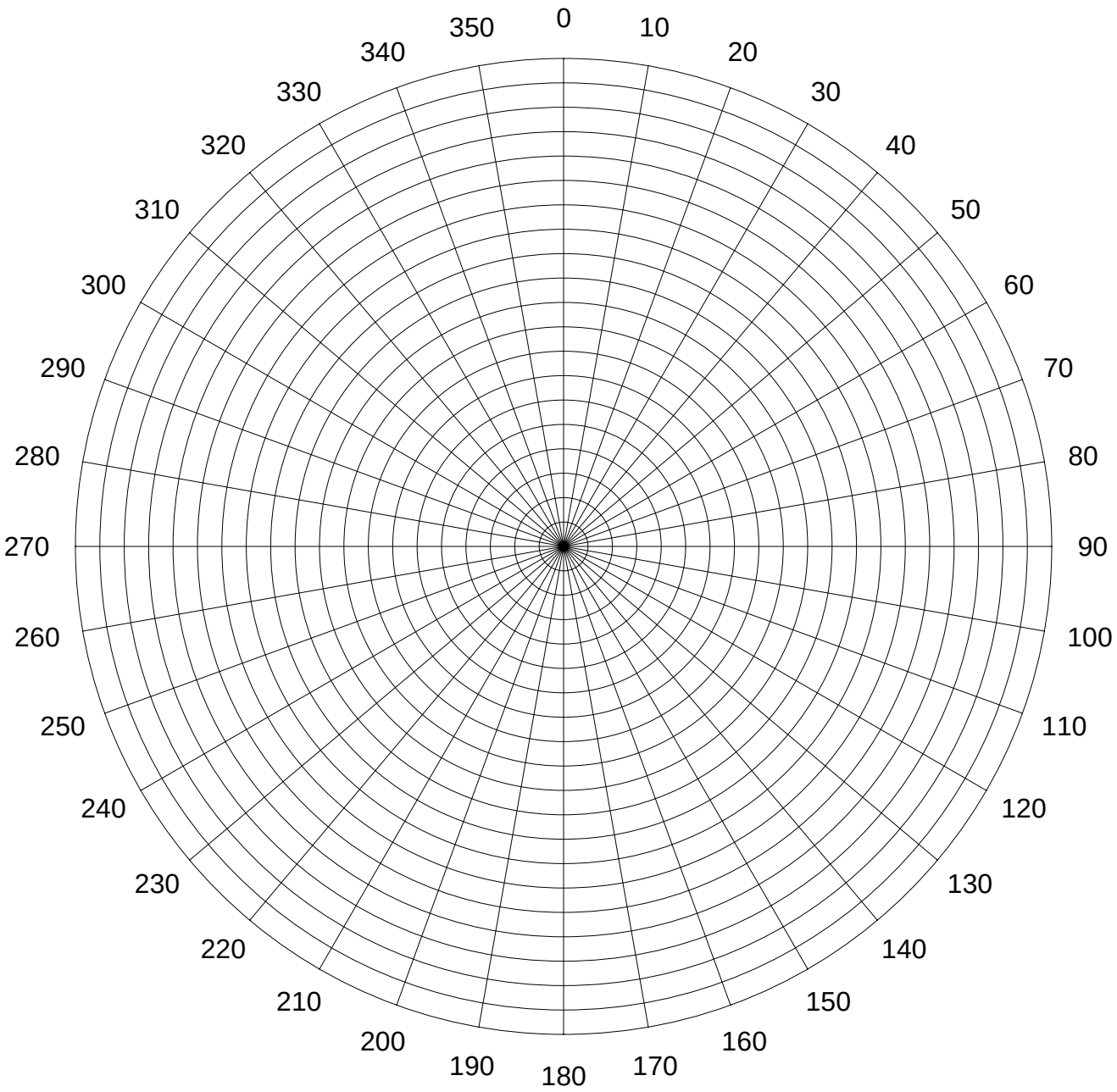
In this example, the "rose petals" show the frequency of occurrence of wind direction recorded at meteorological stations in a hypothetical coastal region, over a 1-week period. The wind azimuth frequencies or counted in "20 degree" azimuthal bins, from 0-20, 20-40, 40-60… etc… 320-240, 340-0. The radial distance from the center of the graph is the frequency or number of stations that recorded a given wind direction, in a given 20-degree bin.

Task 1. Examine the rose diagram above, and fill in the data table below.

Azimuthal Bin	Frequency Count	%Frequency (of total)
0-20	_____	_____
20-40	_____	_____
40-60	_____	_____
60-80	_____	_____
80-100	_____	_____
100-120	_____	_____
120-140	_____	_____
140-160	_____	_____
160-180	_____	_____
180-200	_____	_____
200-220	_____	_____
220-240	_____	_____
240-260	_____	_____
260-280	_____	_____
280-300	_____	_____
300-320	_____	_____
320-340	_____	_____
340-0 (360)	_____	_____
Total	_____	_____

Task 2. Create your own rose diagram showing the frequency distribution of strike azimuths of fractures. The data are listed on the following page, see below for a blank polar / rose graph to construct your frequency diagram. Organize your azimuthal bins into 10-degree increments. Create a tally table listing each azimuthal bin, and tally the number of fracture strikes that occur in each bin. Scale your radial distance on the graph so that the highest frequency recorded properly fills the graph space.

Strike and Dip of Fracture Data - G302 Exercise						
Strike	**Dip**	**Dip_Direction**		**Strike**	**Dip**	**Dip_Direction**
345	65	NE		60	83	SE
329	83	SW		52	84	SE
328	75	NE		68	84	SE
347	74	NE		73	86	NW
330	32	SW		57	70	SE
346	81	NE		70	84	NW
277	74	NE		47	80	NW
330	81	NE		18	85	NW
347	78	NE		38	40	SE
349	48	NE		77	82	SE
292	84	SW		11	27	NE
350	77	NE		78	80	NW
351	15	NE		48	85	NW
350	84	SW		6	56	SE
349	83	NE		39	66	SE
358	80	SW		63	82	SE
300	82	NE		68	80	NW
338	55	NE		53	88	SE
343	78	NE		17	83	NW
353	38	NE		55	82	NW
348	83	SW		72	80	NW
348	81	NE		42	66	SE
287	82	NE		83	75	SE
303	78	NE		52	69	NW
328	75	NE		1	88	SE
293	85	SW		37	84	NW
348	76	NE		68	75	NW
307	69	NE		51	62	NW
316	43	SW		4	88	SE
273	83	SW		55	84	SE
298	18	SW		18	82	NW
303	83	NE		18	80	SE
342	76	SW		54	82	SE
340	22	SW		68	75	SE
280	38	SW		32	85	NW
306	38	SW		52	87	NW
285	82	NE		72	50	NW
312	70	SW		41	64	SE
298	18	SW		84	90	
310	37	SW		3	53	NW
313	83	SW		53	70	NW
347	51	NE		71	72	NW
20	78	NW		15	68	SE
				45	70	NW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