Assignment #1: Analysis of grain size data

In this lab you will summarize grain size data by plotting histograms and cumulative frequency curves and by calculating the various summary statistics based on percentiles. All formulae and examples of the various plots are found in the ERSC/GEOG 2P16 Course Notes.

Tables 1, 2, 3, and 4 show the weight per size class of four samples of sand, based on sieving. For each sample do the following.

1. Complete each table by calculating the frequency per size class as a percentage of the total weight of the sample and the cumulative frequency, per size class, expressed as a percentage.

2. Plot frequency (%) versus size class as histograms on the appropriate diagrams on pages 6 to 9.

3. Plot cumulative frequency (%) versus size class on the diagrams on pages 10 and 11. **Note:** plot curves for samples 1, 2 and 3, on the graph paper on page 10 and curve 4 on the graph paper on page 11. To form the cumulative frequency curves join each of the plotted points for each sample.

4. Complete Table 5 with percentiles taken from each of the curves constructed in 3, above (see course notes).

5. Complete Table 6 with the calculated values of the various descriptive measures of grain size distributions and the appropriate terms to describe the samples (see course notes).

6. Show the position of the median and the mean of each distribution on the appropriate histogram.

7. Briefly describe the attributes of each cumulative frequency curve in terms that will allow you to very qualitatively interpret other such curves based on other sediment samples (i.e., relate the form of each curve in terms that will help you interpret other cumulative frequency curves based on other samples).

Sample 1:

Size Class (ϕ)	Weight (g)	Frequency (%)	Cumulative Frequency (%)
-1	0		
-0.5	0		
0	0.30		
0.5	1.48		
1	4.48		
1.5	7.14		
2	8.18		
2.5	6.88		
3	4.00		
3.5	1.26		
4	0.24		
Total:	**33.96**		

Sample 2:

Size Class (ϕ)	Weight (g)	Frequency (%)	Cumulative Frequency (%)
-1	0		
-0.5	0		
0	1.38		
0.5	9.39		
1	11.76		
1.5	8.16		
2	4.53		
2.5	2.28		
3	0.99		
3.5	0.45		
4	0.21		
Total:	**39.15**		

Sample 3:

Size Class (ϕ)	Weight (g)	Frequency (%)	Cumulative Frequency (%)
-1	0.03		
-0.5	0.27		
0	0.57		
0.5	1.05		
1	1.65		
1.5	2.31		
2	5.37		
2.5	16.32		
3	3.6		
3.5	.03		
4	0		
Total:	**31.2**		

Sample 4:

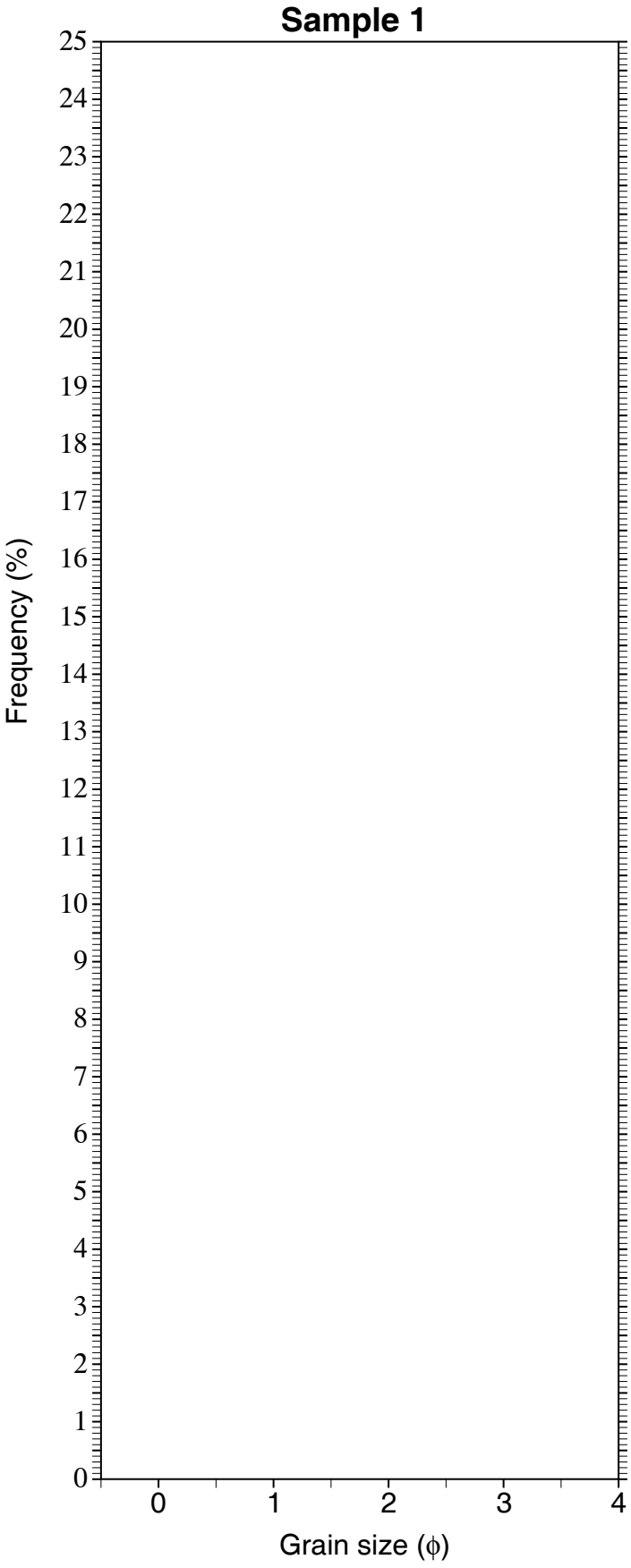
Size Class (ϕ)	Weight (g)	Frequency (%)	Cumulative Frequency (%)
-1.0	0		
-0.75	0.09		
-0.50	0.83		
-0.25	1.62		
0	1.38		
0.25	0.79		
0.50	1.21		
0.75	2.32		
1.0	3.34		
1.25	4.11		
1.5	4.54		
1.75	4.48		
2	3.98		
2.25	3.16		
2.5	2.10		
2.75	1.08		
3.0	0.88		
3.25	1.57		
3.50	1.57		
3.75	0.62		
4.0	0.06		
Total:	**39.73**		

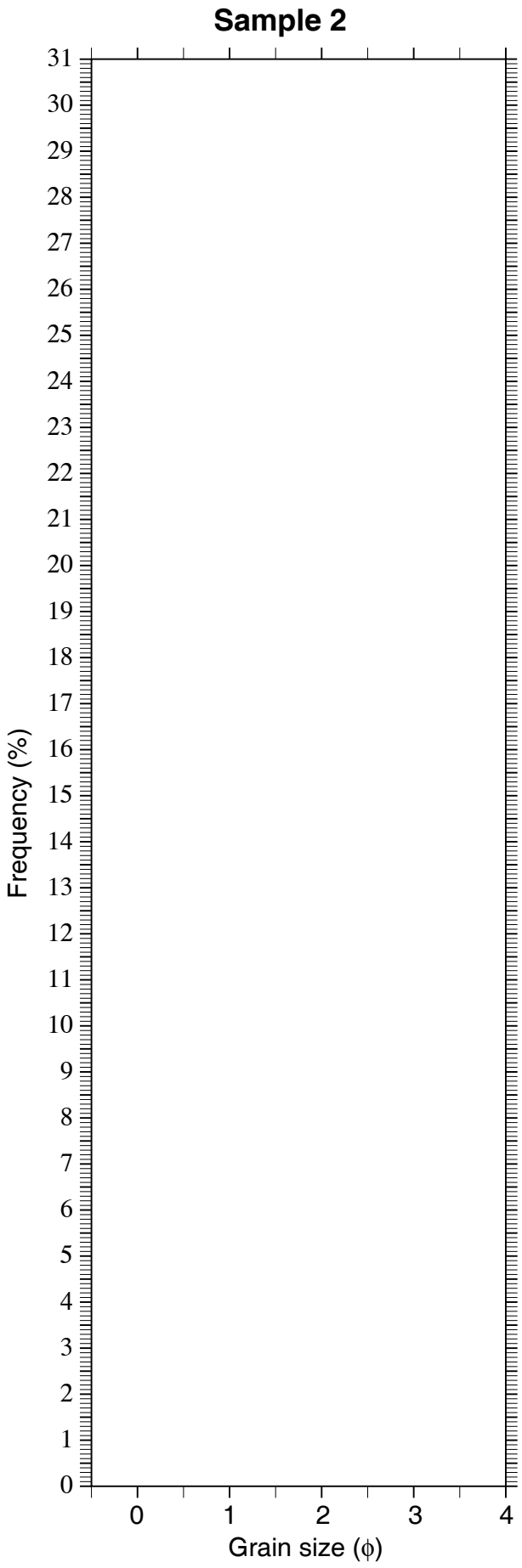
Table 5. Percentiles from Cumulative Frequency Curves

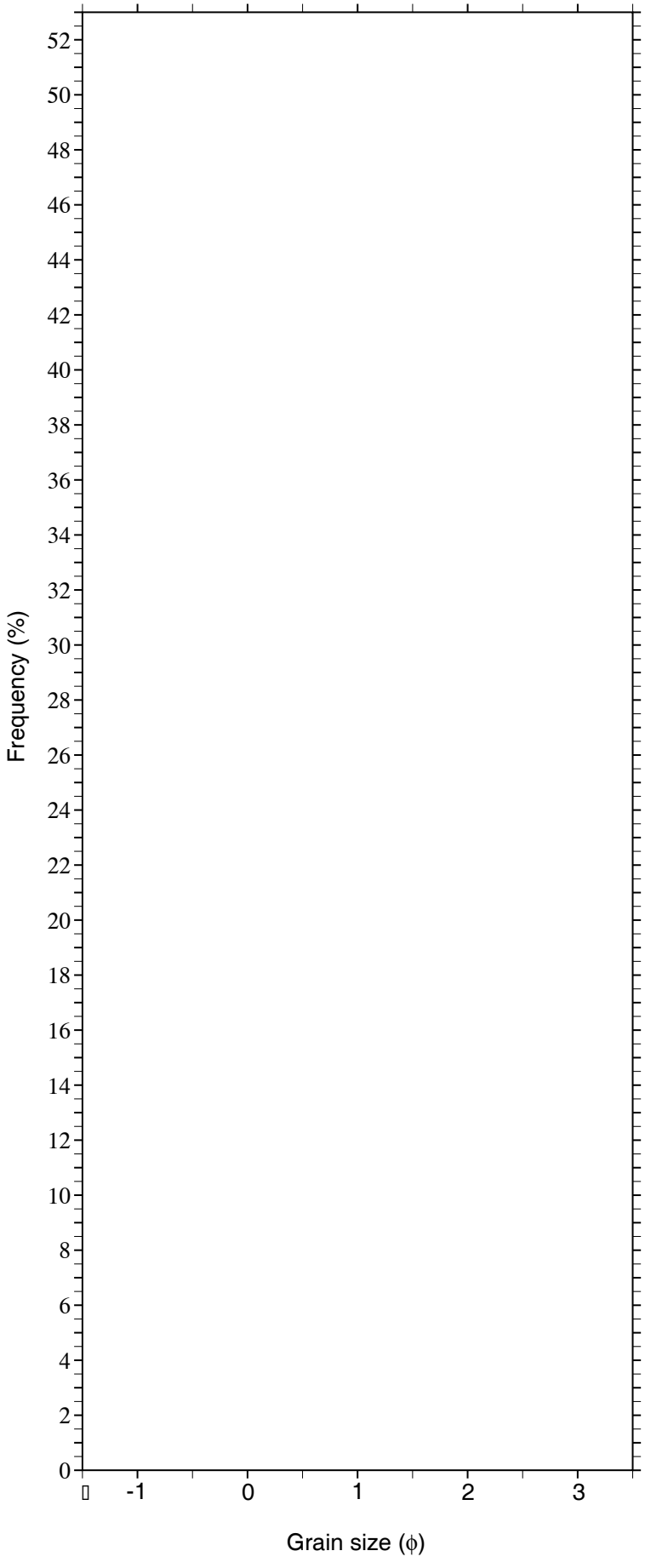
	Sample 1	Sample 2	Sample 3	Sample 4
ϕ_5				
ϕ_{16}				
ϕ_{25}				
ϕ_{50}				
ϕ_{75}				
ϕ_{84}				
ϕ_{95}				

Table 6. Descriptive Measures (Graphical Method)

	Sample 1	Sample 2	Sample 3	Sample 4
Median				
Mean				
Standard				
Skewness				
Kurtosis				


Sample 1
Frequency (%)
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
0
1
2
3
4
Grain size (ϕ)


Sample 2
Frequency (%)
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
0
1
2
3
4
Grain size (ϕ)



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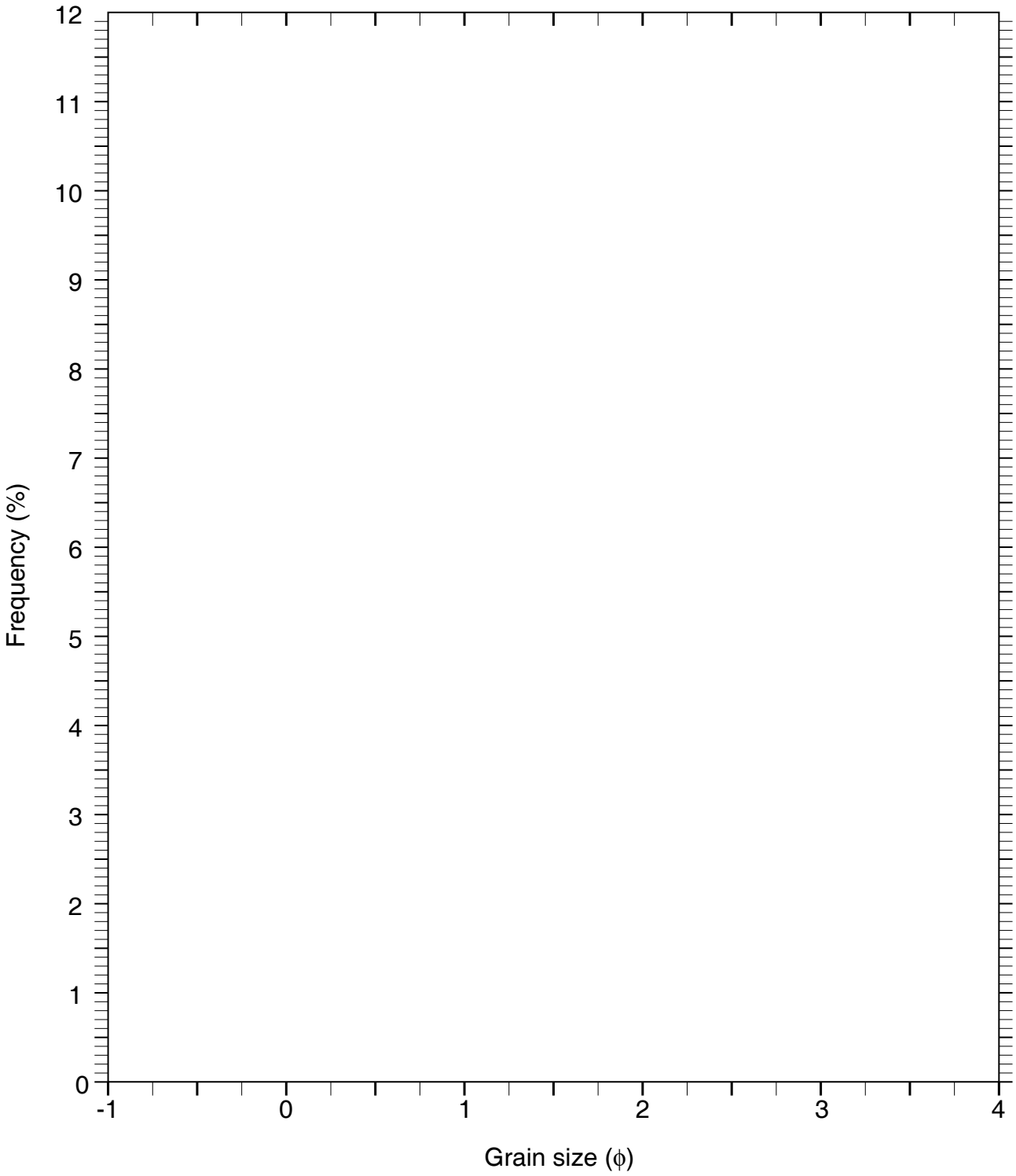
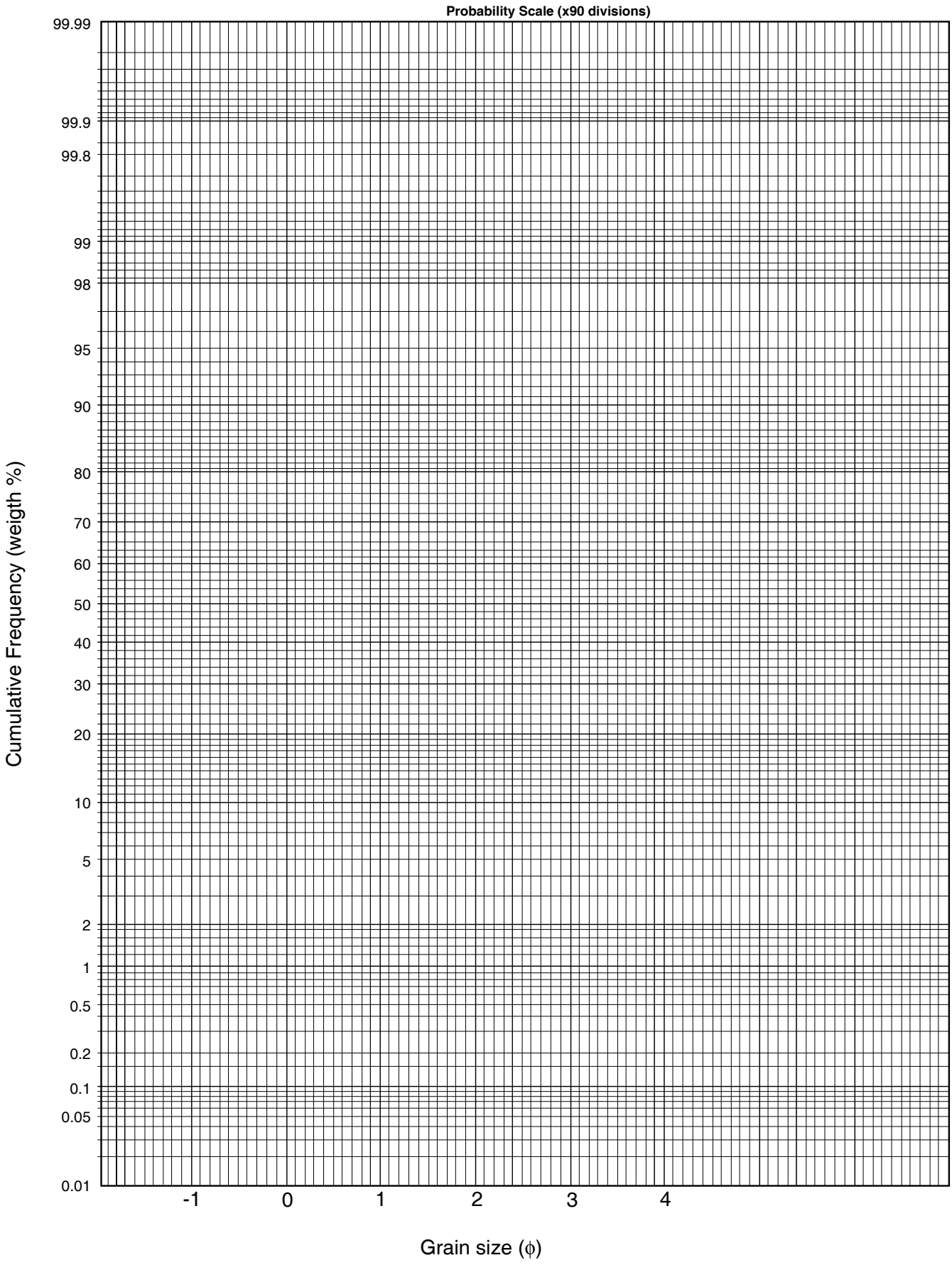
Sample 4





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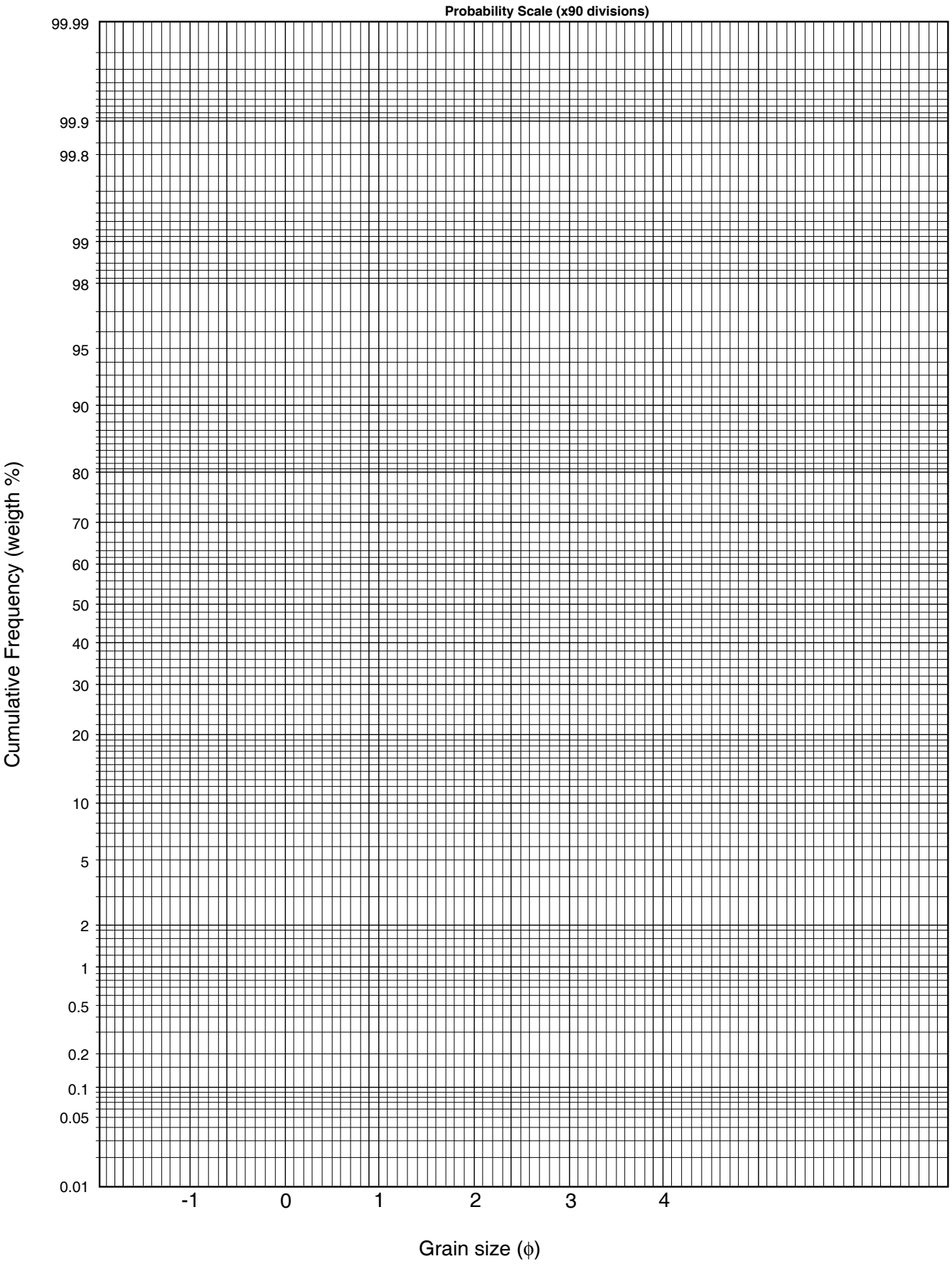

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