

Answer all questions using complete sentences.

1. A data set has values ranging from a low of 10 to a high of 52. What's wrong with using the class limits 10 – 19, 20 – 29, 30 – 39, 40 – 49 for a frequency table?

you miss out on values 50-52.

2. A data set with whole numbers has a low value of 20 and a high value of 82. Find the class width and class limits for a frequency table with 7 classes.

$$\text{class width} = \frac{82-20}{7} = 8.8$$

$$\text{class width} = 9$$

Class Limits

20-28	65-73
29-37	74-82
38-46	
47-55	
56-64	

3. You are a manager of a specialty coffee shop and collect data throughout a full day regarding waiting time for customers from the time they enter the shop until the time they pick up their order.
- a. What type of distribution do you think would be most desirable for the waiting times: skewed right, skewed left, mound-shaped symmetrical? Explain.

Skewed right, hoping most of the wait times are low, with only a few times at the higher end.

- b. What if the distribution for waiting times were bimodal? What might be some explanations?

This might reflect the fact that when there are lots of customers, most of the waiting times are longer. When there are fewer customers, the lines are shorter and so are the wait times.

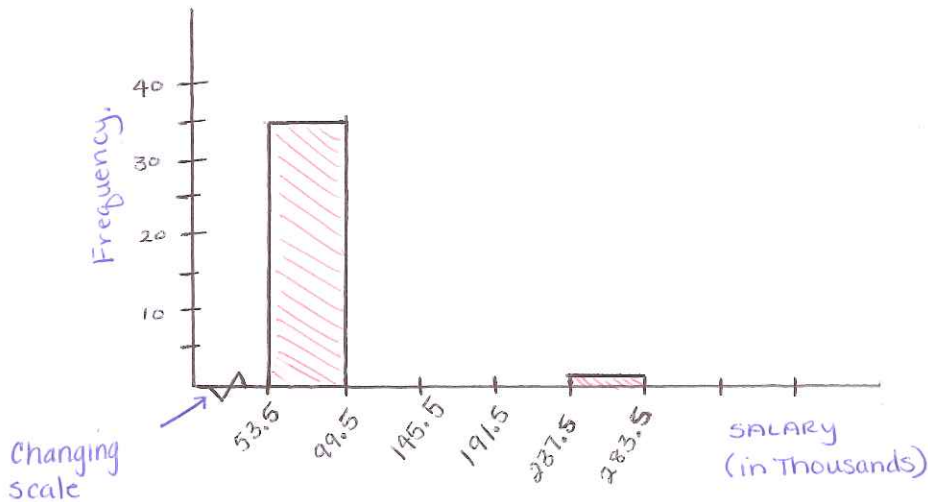
4. A web site rated 100 colleges and universities and ranked them from 1 to 100, with a rank of 1 being best. Each college or university was ranked, and there were no ties. If the ranks were displayed in a histogram, what would be the shape of the histogram: skewed, uniform, mound-shaped?

Uniform as there will be one university at each ranking.

5. The following data represent salaries, in thousands of dollars, for employees of a small company. Notice that the data have been sorted in increasing order.

54	55	55	57	57	59	60	65	65
65	66	68	68	69	69	70	70	70
75	75	75	75	77	82	82	82	88
89	89	91	91	97	98	98	98	280

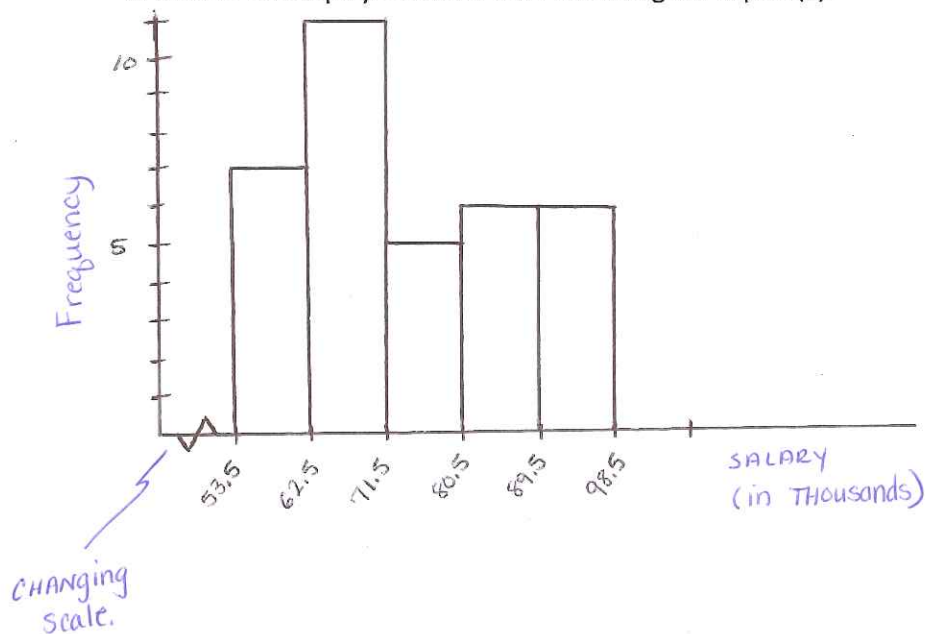
- a. Make a histogram using the class boundaries 53.5, 99.5, 145.5, 191.5, 237.5, 283.5.



- b. Look at the last data value. Does it appear to be an outlier? Could this be the owner's salary?

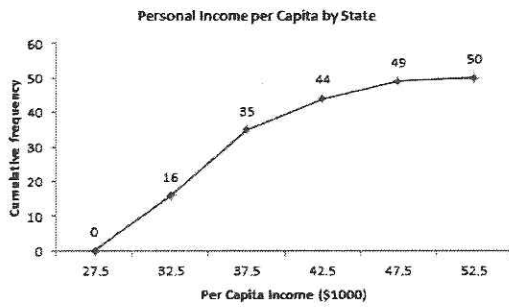
*The last value does appear to be an outlier. It is possible that this value could be the owner's salary.*

- c. Eliminate the high salary of 280 thousand dollars. Make a new histogram using the class boundaries 53.5, 62.5, 71.5, 80.5, 89.5, 98.5. Does this histogram reflect the salary distribution of most of the employees better than the histogram in part (a)?

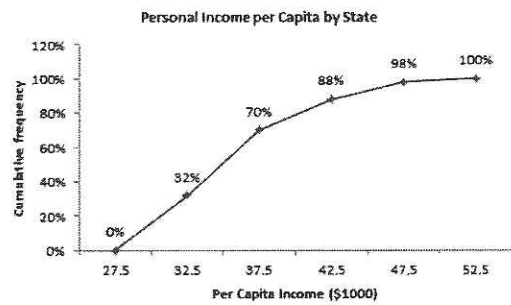


6. The ogives shown below are based on U.S. Census data and show the average personal income per capita for each of the 50 states. The data are rounded to the nearest thousand dollars.

(i) Ogive



(ii) Ogive Showing Cumulative Percentage of Data



- a. How were the percentages shown in graph (ii) computed?

each cumulative frequency was divided by 50 then converted to a percent.

- b. How many states have average per capita income less than 37.5 thousand dollars?

35 states have average per capita income less than 37.5 thousand dollars.

- c. How many states have average per capita income between 42.5 and 52.5 thousand dollars?

6 states are between 42.5 and 52.5

- d. What percentage of the states have average per capita income more than 47.5 thousand dollars?

2% have per capita income more than 47.5 thousand dollars

7. How long does it take to finish the 1161-mile Iditarod Dog Sled Race from Anchorage, Alaska to Nome Alaska? Finish times (to the nearest hour) for 57 dogsled teams are shown below.

261	271	236	244	279	296	284	299	288
288	247	256	338	360	341	333	261	266
287	296	313	311	307	307	299	303	277
283	304	305	288	290	288	289	297	299
332	330	309	328	307	328	285	291	295
298	306	315	310	318	318	320	333	321
323	324	327						

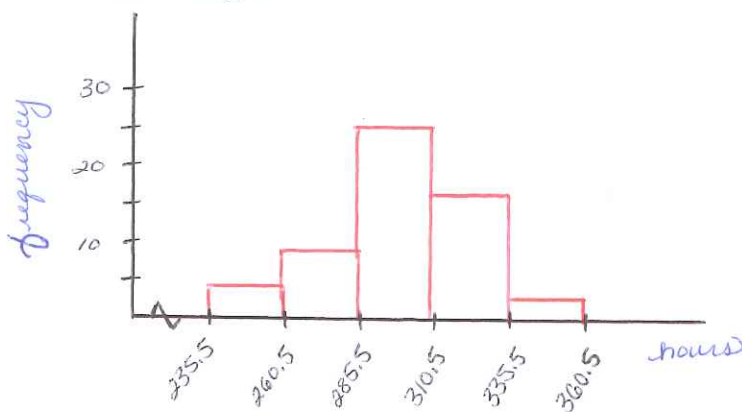
- a. Using five classes, find the class width.

$$C.W. = \frac{360 - 236}{5} = 24.8 = \boxed{25}$$

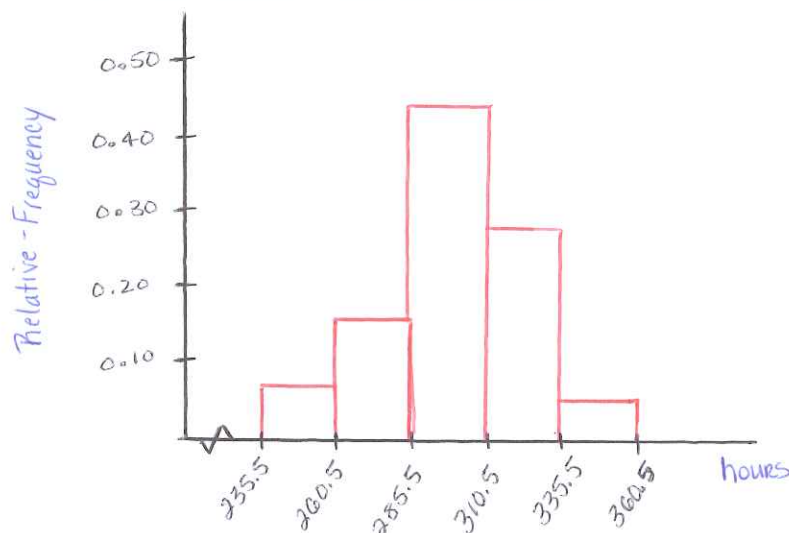
- b. Make a frequency table showing class limits, class boundaries, midpoints, frequencies, relative frequencies, and cumulative frequencies.

Class Limits	Class Boundaries	Midpoint	Frequency	Relative Frequency	Cumulative Frequency
236 - 260	235.5 - 260.5	248	4	0.07	4
261 - 285	260.5 - 285.5	273	9	0.16	13
286 - 310	285.5 - 310.5	298	25	0.44	38
311 - 335	310.5 - 335.5	323	16	0.28	54
336 - 360	335.5 - 360.5	348	3	0.05	57

- c. Draw a histogram.



- d. Draw a relative-frequency histogram.



- e. Categorize the basic distribution shape as uniform, mound-shaped symmetrical, bimodal, skewed left, or skewed right.

*Approximately mound-shaped symmetrical*

- f. Draw an ogive.

