1. The graph below displays the scores of 32 students on a recent exam. Scores on this exam ranged from 64 to 95 points.

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6 | * *
6 | * *
7 | * * *
7 | * * * *
8 | * * * *
8 | * * * * * *
9 | * * * * * * *
9 | * * * *
```
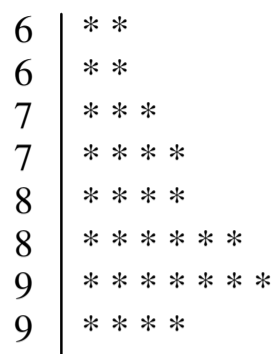
(a) Describe the shape of this distribution.

(b) In order to motivate her students, the instructor of the class wants to report that, overall, the class's performance on the exam was high. Which summary statistic, the mean or the median, should the instructor use to report that overall exam performance was high? Explain.

(c) The midrange is defined as $\dfrac{\text{maximum} + \text{minimum}}{2}$. Compute this value using the data on the preceding page.

Is the midrange considered a measure of center or a measure of spread? Explain.

(d) If a student is randomly selected from this group, what is the probability that their score is less than 80?

(e) These 32 scores are a random sample of the scores from the 150 students who took this exam with this professor. Is it reasonable to make generalizations about all 150 students based on these data? Why or why not?

(f) The instructor decides to use this random sample to make a confidence interval for the mean score. Are the conditions for inference satisfied?

Note: A complete answer key with rubric for parts a-c can be found here:

https://secure-media.collegeboard.org/apc/_ap05_sg_statisticsb__46664.pdf

(a)The distribution is skewed left.

(b) A skewed left distribution will pull the mean towards the lower tail, making it lower than the median. So if the instructor wants to make the make the performance appear higher, she should report the median.

(c) (64+95)/2 = 79.5; this is a measure of center as it uses the lowest value and the highest value and then finds the value in-between them.

(d) If a student is randomly selected from this group, what is the probability that their score is less than 80?
11/32 = 34.375%

(e) These 32 scores are a random sample of the scores from the 150 students who took this exam with this professor. Is it reasonable to make generalizations about all 150 students based on these data? Why or why not?
Yes. Since the 32 students are a random sample of all 150 students, it is reasonable to draw conclusions about this population given this sample.

(f) The instructor decides to use this random sample to make a confidence interval for the mean score. Are the conditions for inference satisfied?
No. This is a random sample and 32 >30, so by the CLT we know the sampling distribution of the sample mean is approximately normal. However, 32 > 10% of 150. This raises concerns that the students we observed would not be independent observations and that the standard deviation of the sampling distribution would be incorrect.