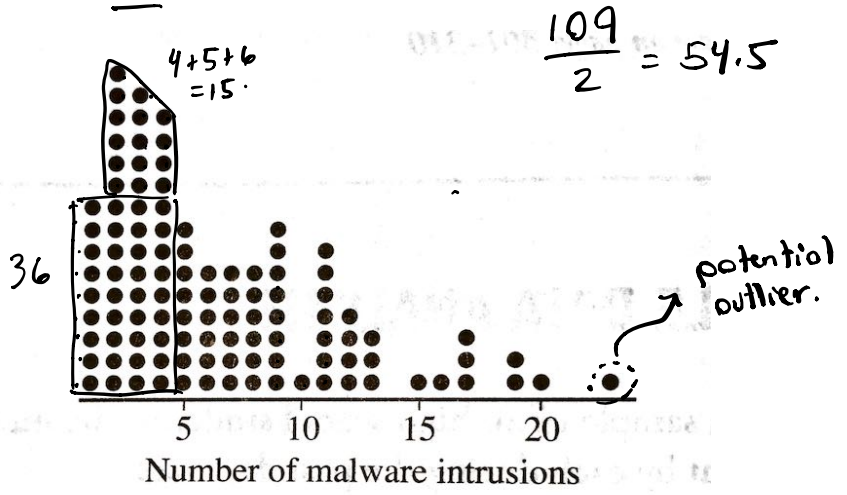
PRACTICE XII

1. A bank of cybersecurity engineer notes the number of malware intrusions intercepted each hour during a random sample of 109 hour-long periods.



(a) Describe the distribution

Shape: The distribution appears to be skewed right with a potential outlier at around 23

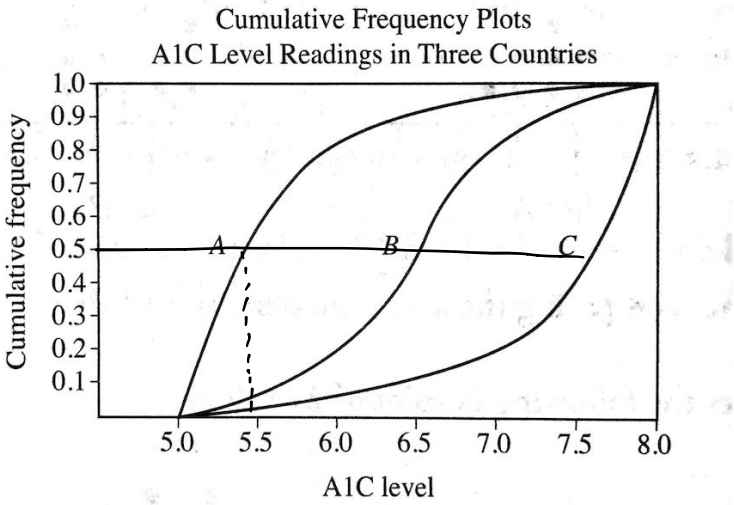
Center: The median is around 5 malware intrusions.

Spread: the range is 23 - 1 = 22 malware intrusions.

(b) Is the quotient, $\frac{\text{mean intrusions}}{\text{median intrusions}}$. greater than 1, less than 1, or approximately 1? Explain.

In a skewed right distribution the mean is usually larger than the median (because the mean is sensitive to high values). For this reason $\frac{\text{mean intrusions}}{\text{median intrusions}}$ is likely greater than one.

2. The A1C test is used to diagnose diabetes. Cumulative graphs of A1C level readings in the populations of three countries (A, B, and C) are given below.



(a) Write a few sentences comparing the distributions of A1C level readings in the three countries.

Shape: Country A appears to have a skewed right distribution as the CDF rises fast at first and slower later. This is the opposite of country C, which appears to have a skewed left distribution (more high A1C levels). Finally Country B appears to have a bell-shaped distribution as the CDF rises slowly on the tails and steeply in the middle.

Center: The median of A appears to be ~5.5 which is smaller to the median A1C of B which appears to be ~6.5. Finally Country C has the highest median A1C levels at ~7.5.

Spread: The spreads of all three countries A1C levels range from 5 - 8.