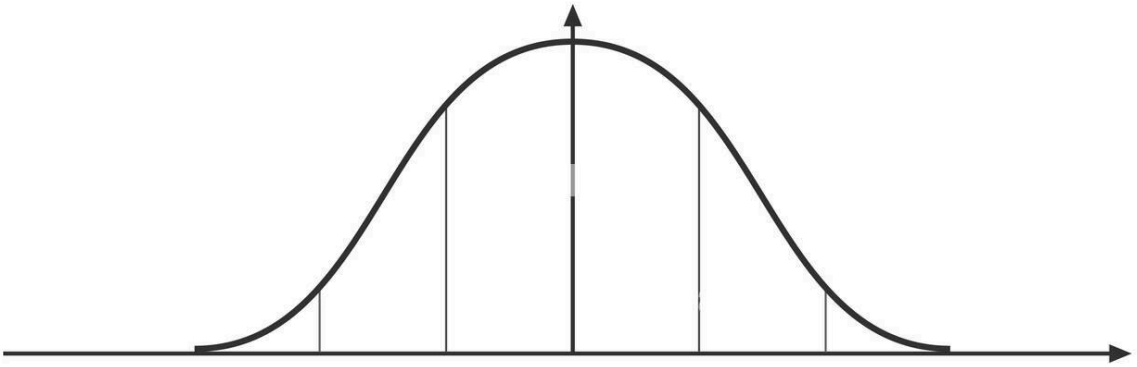
Empirical Rule Worksheet

Warm-up questions

1. Label the symmetric mound-shaped distribution with mean, standard deviation, and percentages in each tail.



Guided questions to develop Empirical Rule intuition

1. Draw a simple mound-shaped curve and mark the percentages in each tail

2. If we know approximately 68% of observations fall within one standard deviation of the mean, what percentage falls outside that interval?

3. How many observations fall outside of 95%?

4. How many observations fall outside of three standard deviations away from the mean?

Guided numerical practice (use concrete numbers)

1. Let μ=60, σ=4. Compute numerically the 68% interval using the Empirical Rule.

2. With the same number, estimate the percent of observations greater than 68.

3. With $\mu=60$, $\sigma=4$, estimate percent less than 54.

4. Multiple-choice quick check: If $\mu=200$ and $\sigma=25$, which interval contains about 95% of data?
   A. 175 to 225
   B. 150 to 250
   C. 125 to 275

Target problem — walkthrough and full solution

A tire company reports that the mean mileage before replacement for its all-season tires is 50 miles, with a standard deviation of 4 miles. Assume the distribution of tire lifespans is approximately mound-shaped and symmetric.

1. Use the Empirical Rule to determine an interval that contains approximately 95% of all tire lifespans.

2. Use the Empirical Rule to estimate the proportion of tires that last shorter than 58 miles.