

Exploring One-Variable Data: Shape, Center, Spread

Grade 12 – AP Statistics math · Test · Standards: AP Statistics Unit 1 (2026-27)

Name: _____ Date: _____ Class: _____

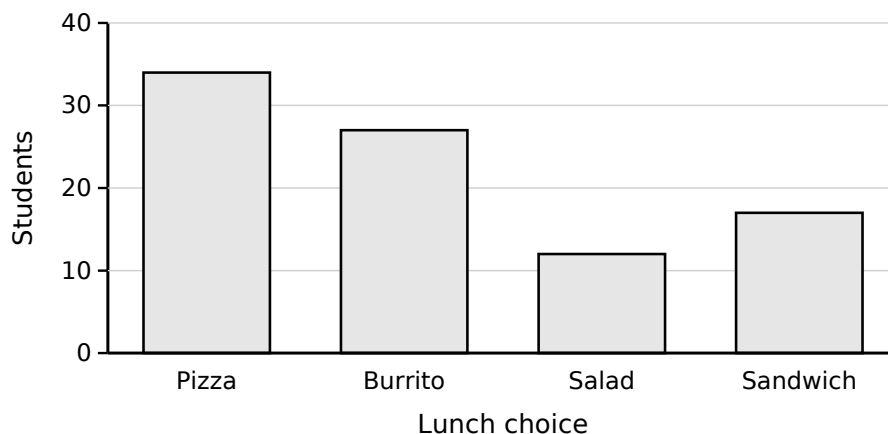
This 45-minute test has nine AP-style questions worth 20 points. Show all calculations, use complete sentences for interpretations, and refer to the context of each situation.

Standards: AP Statistics Unit 1 (2026-27) · **Level:** Grade 12 AP Statistics

Time: 45 minutes · 9 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Categorical Data (2 points)

The bar graph shows the lunch chosen by 90 students.



Lunch choices.

- Is the variable categorical or quantitative? Explain. (1 point)
- What percent of the students chose a burrito? (1 point)

Question 2 Mean, Median and Shape (2 points)

Ten students recorded the minutes they spent on a bus: 3, 4, 4, 5, 5, 6, 7, 8, 12, 26.

- Calculate the mean and the median. (1 point)
- Describe the shape and state which measure of center is more appropriate. Justify. (1 point)

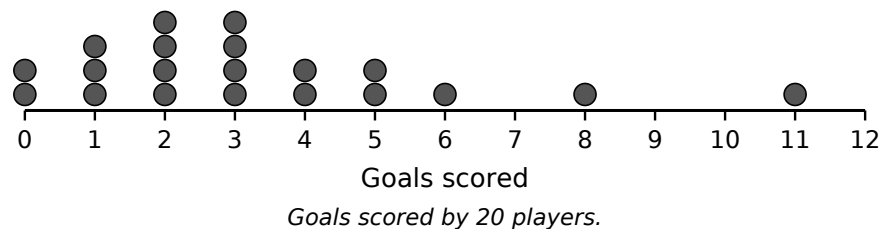
Question 3 Outliers and Boxplot (3 points)

Twelve commute times in minutes: 22, 25, 27, 28, 30, 31, 33, 34, 36, 38, 41, 64.

- Find the five-number summary. (1 point)
- Use the $1.5 \times \text{IQR}$ rule to determine whether any value is an outlier. (1 point)
- Draw a modified boxplot. (1 point)

Question 4 Percentile and Shape (2 points)

The dotplot shows goals scored by 20 players in a season.



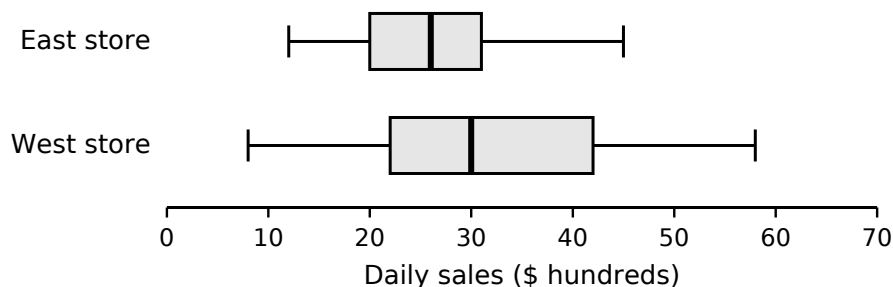
- Find the percentile of a player who scored 4 goals. (1 point)
- Describe the shape of the distribution. (1 point)

Question 5 Comparing Performances (2 points)

Priya ran 400 meters in 62.4 seconds (team mean 66.0 s, standard deviation 3.0 s) and long jumped 5.05 meters (team mean 4.60 m, standard deviation 0.30 m). Lower times are better. Using z-scores, in which event was she better relative to her team?

Question 6 Comparing Boxplots (3 points)

The boxplots show daily sales at two stores.



Daily sales at two stores.

- Compare the centers of the two distributions in context. (1 point)
- Compare the spreads in context. (1 point)
- Which store has more consistent sales? Justify. (1 point)

Question 7 Empirical Rule (2 points)

Waiting times at a ride are approximately normal with mean 24 minutes and standard deviation 5 minutes. Use the empirical rule to find (a) the interval containing the middle 95% of waits, and (b) the percent of waits shorter than 19 minutes.

Question 8 Normal Calculations (2 points)

Heights of a plant variety are approximately normal with mean 63 cm and standard deviation 8.5 cm. (a) Find the proportion of plants taller than 75 cm. (b) Find the 20th percentile of the heights.

Question 9 Transforming Scores (2 points)

On an 80-point exam the scores have mean 52, median 54 and standard deviation 9. The teacher adds 6 points to every score, then multiplies each new score by 1.25 to convert to a 100-point scale. Find the new mean, median and standard deviation.