

Data Displays, Scatterplots & Modeling

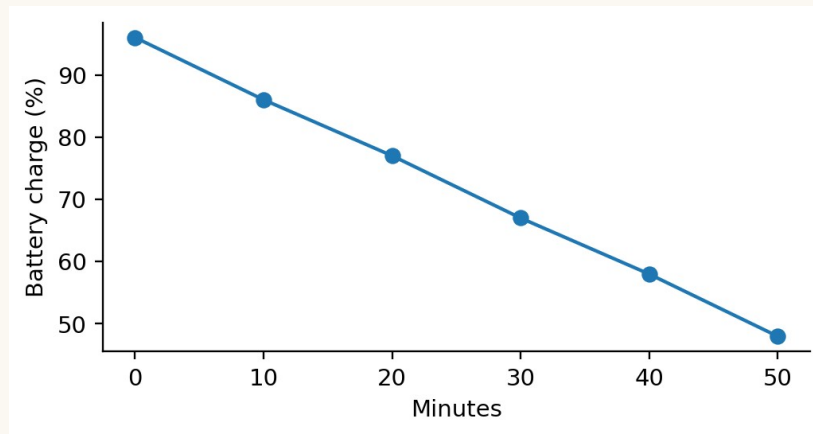
Foundation to Challenge

Practice should make the test feel easier, not merely familiar.

Work without the answer key first. When you finish, use the QR code on the final page to check your answers online.

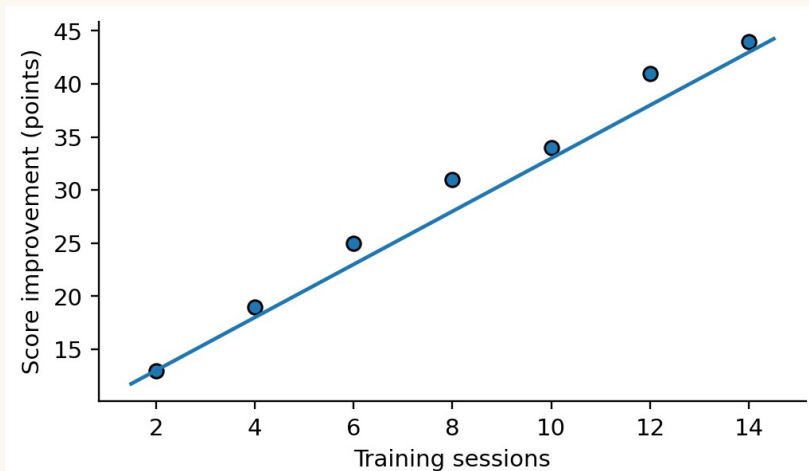
FOUNDATION

- 1** The line graph shows a delivery drone's battery charge. At what recorded time is the charge first below 60%?



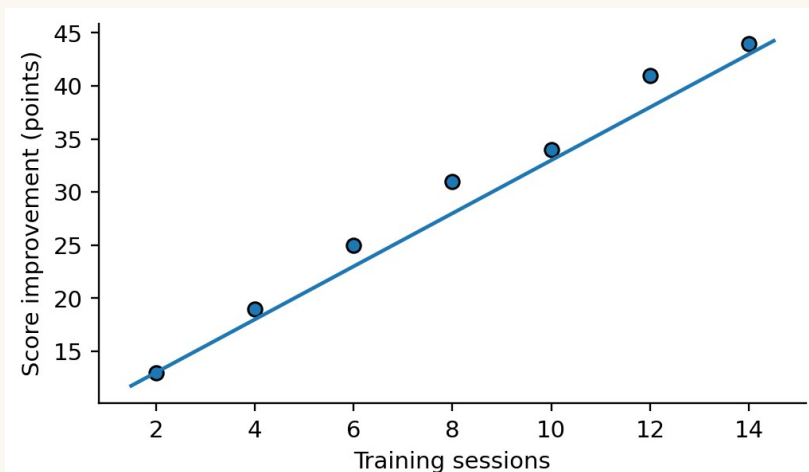
- A. 20 minutes
- B. 30 minutes
- C. 40 minutes
- D. 50 minutes

- 2 The scatterplot includes a line of best fit. According to the line, what score improvement is predicted after 12 training sessions?



- A. 32 points
- B. 35 points
- C. 38 points
- D. 41 points

- 3 For 12 training sessions, the actual improvement shown on the scatterplot is 41 points and the line of best fit predicts 38 points. What is the residual, actual minus predicted?



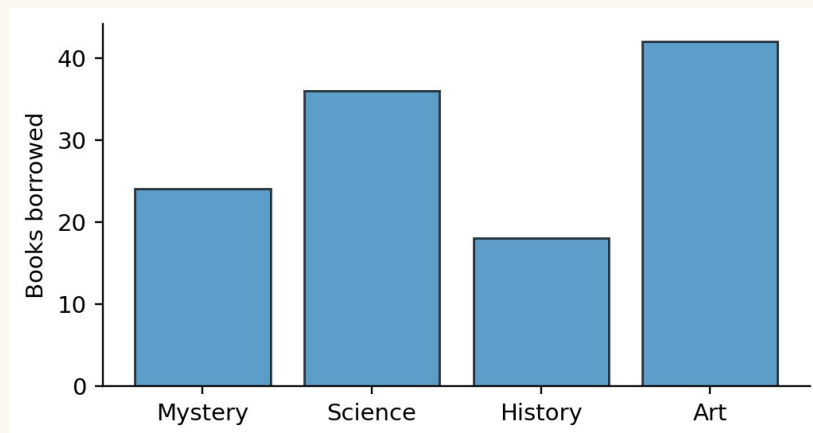
- 4 A model for weekly online orders is $y = 3.2x + 18$, where x is advertising spending in thousands of dollars and y is the number of orders in hundreds. What does the slope 3.2 represent?

A. About 3.2 more orders for each additional \$1,000 spent.
B. About 320 more orders for each additional \$1,000 spent.
C. About \$3,200 more spending for each additional order.
D. About 1,800 orders when no money is spent.

- 5 A quantity has values 160, 200, 250, and 312.5 at equally spaced time intervals. Which type of model is most appropriate?

A. Linear, because the differences are constant.
B. Linear, because the ratios are constant.
C. Exponential, because the ratios are constant.
D. Exponential, because the differences are constant.

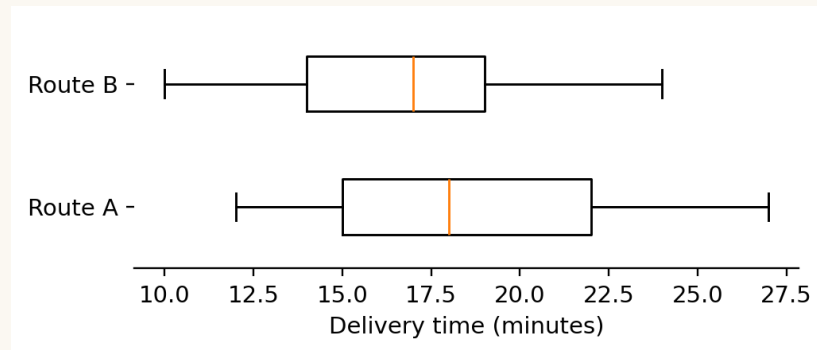
- 6 The bar chart shows books borrowed from four sections of a library in one week. What percent of the 120 books came from the Science section?



A. 15%
B. 24%
C. 30%
D. 36%

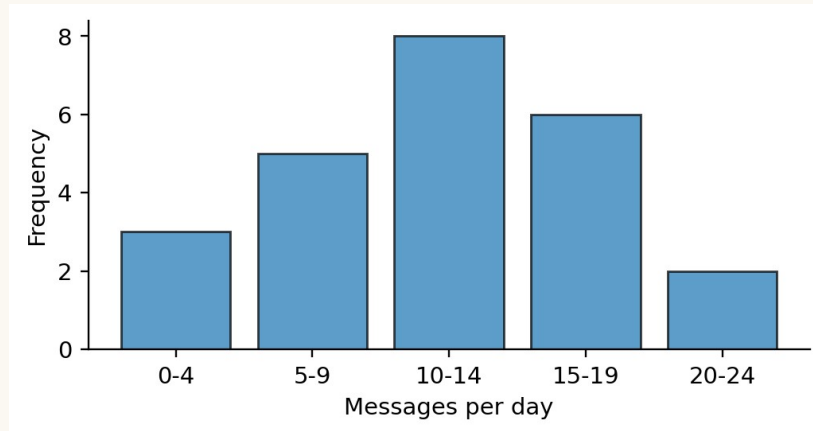
- 7 A survey records 45 commuters: 18 use rail, 15 use bus, and 12 drive. What fraction of the commuters use either rail or bus?
- A. $\frac{3}{5}$
 - B. $\frac{11}{15}$
 - C. $\frac{4}{5}$
 - D. $\frac{7}{15}$

- 8 The box plots compare delivery times for two routes. Which statement must be true?



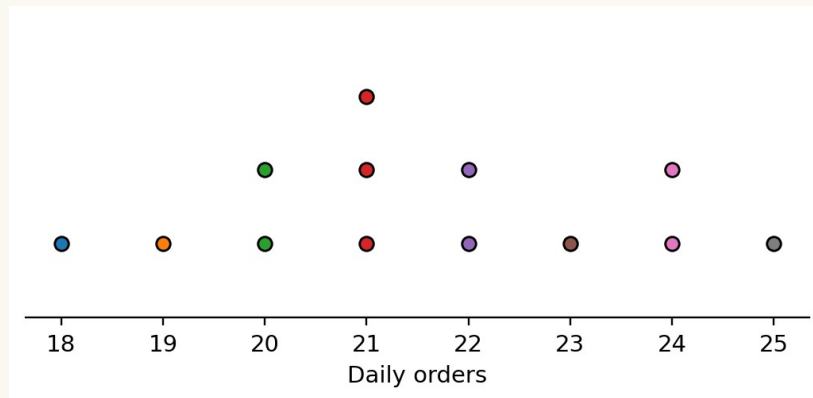
- A. Route A has the larger median.
- B. Route B has the larger median.
- C. Route A has the smaller interquartile range.
- D. The two routes have the same range.

- 9 The histogram summarizes 24 observations. In which interval must the median lie?



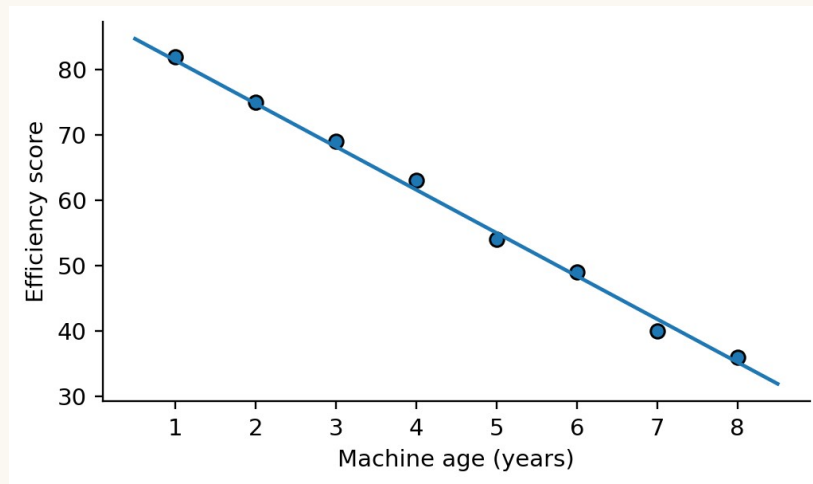
- A. 5-9
- B. 10-14
- C. 15-19
- D. 20-24

- 10 The dot plot shows daily orders. Which change would definitely increase the standard deviation?



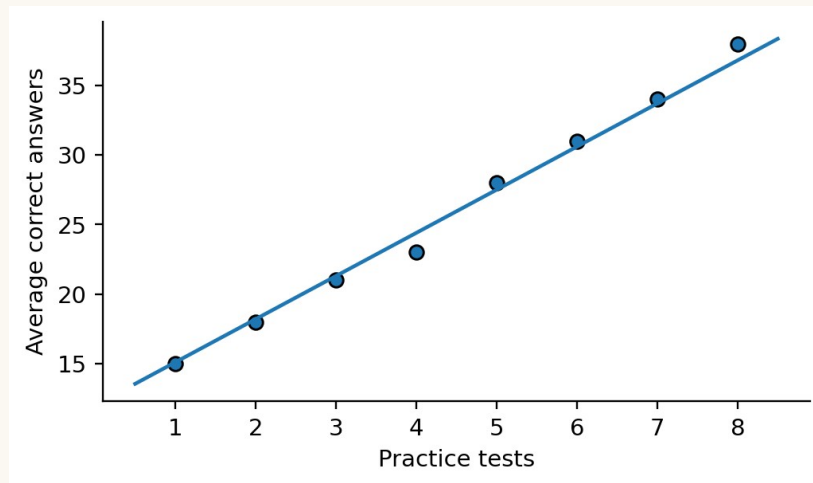
- A. Add the same number to every value.
- B. Multiply every value by 0.5.
- C. Replace one of the values 21 with 40.
- D. Remove the smallest value and replace it with the median.

- 11 The scatterplot shows machine age and efficiency score. Which description best matches the association?



- A. Strong positive association
- B. Strong negative association
- C. No association
- D. A curved association with no overall direction

- 12 The line of best fit in the scatterplot can be approximated by $y = 3.1x + 12$. What value of y does the model predict when $x = 7$? Give your answer to the nearest tenth.



- 13** A model is $y = 1.8x + 12$. When $x = 10$, the observed value of y is 34. What is the residual, observed minus predicted?

- 14** Plant height is modeled by $h = 4.5w + 11$, where w is time in weeks and h is height in centimeters. What does 4.5 represent?
- A. The plant's starting height is 4.5 cm.
 - B. The plant grows about 4.5 cm per week.
 - C. The plant reaches 11 cm after 4.5 weeks.
 - D. The plant grows 11 cm per week.

CHALLENGE

- 15** A bacterial culture has 300 cells at time 0, 420 after 2 hours, 588 after 4 hours, and 823.2 after 6 hours. Which statement best describes the pattern?
- A. Linear with an increase of 120 cells every 2 hours.
 - B. Linear with an increase of 40% every 2 hours.
 - C. Exponential with a factor of 1.4 every 2 hours.
 - D. Exponential with a factor of 1.2 every hour.
- 16** Across several cities, a study finds that cities with more kilometers of bike lanes tend to have more bicycle commuters. Which conclusion is supported by the data alone?
- A. Building bike lanes will necessarily cause more people to commute by bicycle.
 - B. More bicycle commuters necessarily cause cities to build bike lanes.
 - C. The variables are associated, but the study alone does not establish causation.
 - D. There is no relationship because the variables use different units.

- 17** For four observed values, Model A has absolute residuals 1, 1, 2, and 4. Model B has absolute residuals 2, 0, 1, and 2. Which model fits these four observations better overall based on the total absolute residual?
- A. Model A, because 8 is less than 5.
 - B. Model A, because its first residual is smaller.
 - C. Model B, because 5 is less than 8.
 - D. The models fit equally well.
- 18** A line of best fit is based on temperature data collected only from 10°C to 30°C. Why should a prediction from the line at 100°C be treated cautiously?
- A. The slope of every line becomes zero outside the data range.
 - B. The prediction is an extrapolation far beyond the observed range.
 - C. Linear models cannot be used with temperature data.
 - D. A line of best fit may be used only for integer inputs.

Check your answers online.

The public practice PDF contains questions only. The answer check lives on the website so you can review your score, identify the kind of mistake you made, and move to the next resource.



ANSWER CHECK

Data Displays & Models

Scan the QR code or visit:

<https://aryalanupme.github.io/sat-data-displays-models.html>

If you are stuck on one question, note the question number and the approach you tried before checking another solution.

Independent resource

This practice set is independently prepared for Digital SAT Math study. It is not produced, endorsed, or approved by College Board. SAT is a trademark of College Board.