

Grade 8 · Lines of Best Fit and Linear Models · Quiz

Common Core 8.SP.A.2, 8.SP.A.3 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

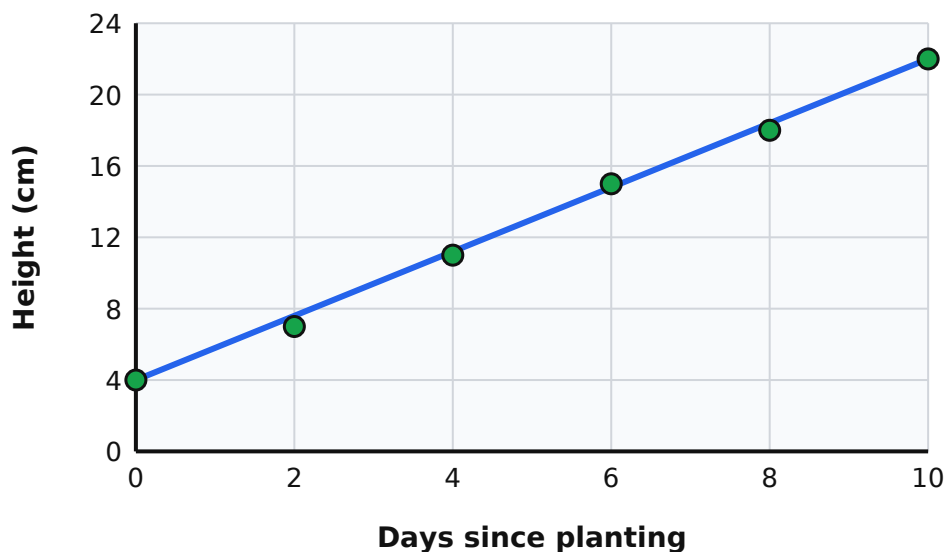
Ten multiple-choice questions check your skill with lines of best fit: judging fit, finding slope and equations, interpreting slope and intercept, and spotting outliers. Pick the one correct answer, then read the explanation to learn from any mistake.

Grade 8 Common Core: 8.SP.A.2 · 8.SP.A.3

Questions

Question 1

Which statement best describes the fit of the line to the plant data?

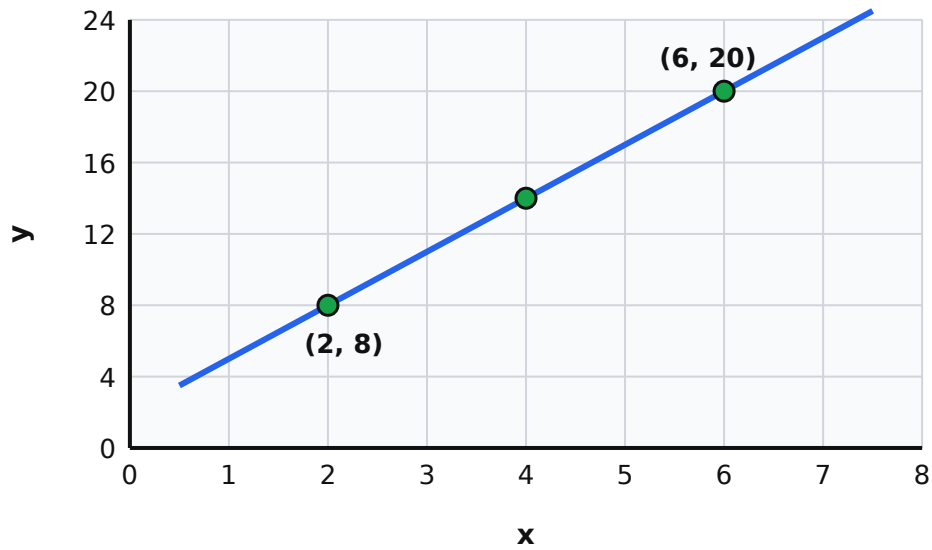


Plant height and days since planting.

- A. Poor fit: the line misses some points
- B. Poor fit: the points should lie on a curve
- C. Good fit: every point is exactly on the line
- D. Good fit: the points are close to the line

Question 2

What is the slope of the line through the two labeled points?



A line through two points.

- A. $\frac{1}{3}$
- B. 3
- C. 4
- D. 12

Question 3

A line of fit has slope 4 and passes through (3,20). What is its equation?

- A. $y = 4x + 8$
- B. $y = 4x + 12$
- C. $y = 4x + 20$
- D. $y = 3x + 20$

Question 4

The cost of renting skates is modeled by $C = 2.5h + 15$, where h is hours. What does 2.5 mean?

- A. The rental costs .50 in total
- B. Each extra hour costs .50
- C. The fixed fee is .50
- D. The skates are rented for 2.5 hours

Question 5

In $C = 2.5h + 15$, what does the y-intercept 15 mean?

- A. The cost rises each hour
- B. The skates are rented for 15 hours
- C. The cost is before any hours are added
- D. The cost is after 1 hour

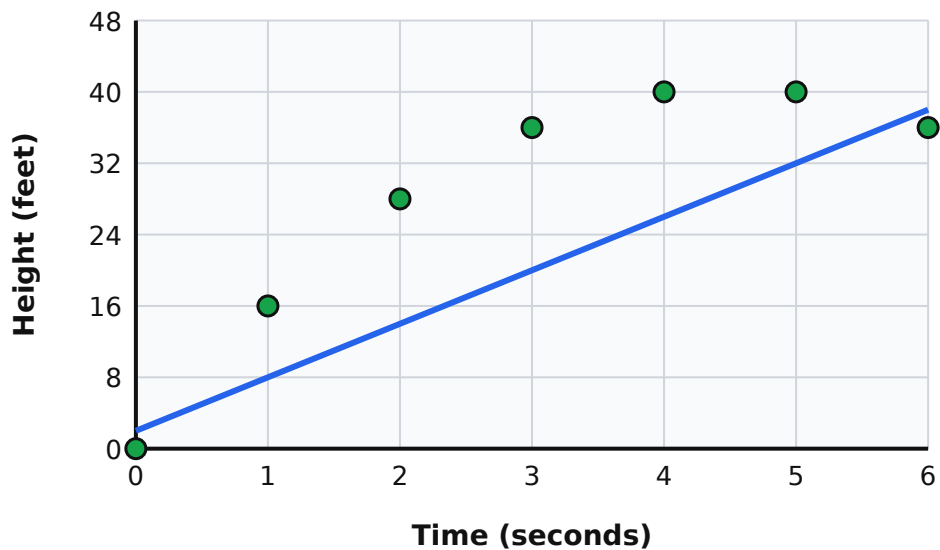
Question 6

Use $C = 2.5h + 15$ to predict the cost of renting skates for 4 hours.

B. .50

Question 7

Is a straight line a good model for the data shown?

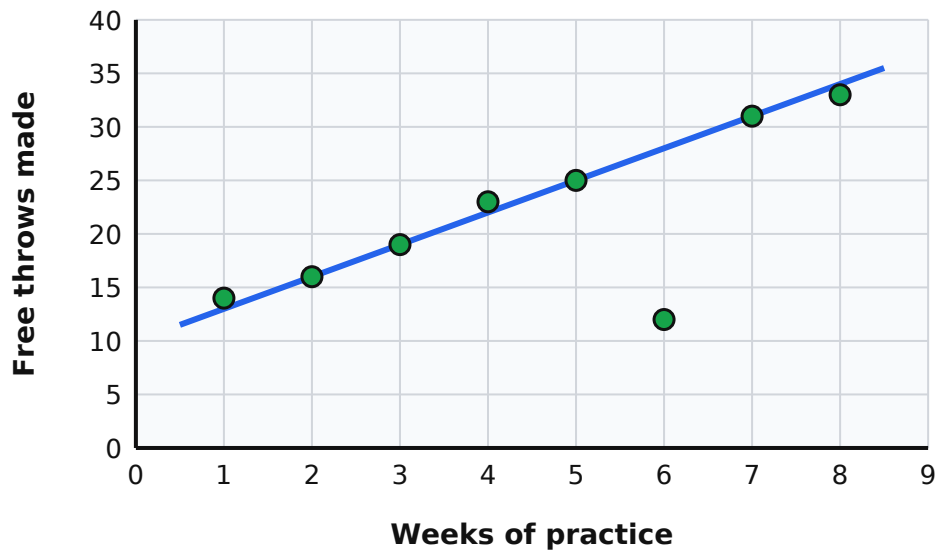


Height of a ball over time.

- A. No, the points curve instead of following a line
- B. Yes, the line passes through two points
- C. Yes, the points mostly go up
- D. No, because the line has a positive slope

Question 8

Which point is the outlier?



Free throws made over 8 weeks.

- A. (1,14)
- B. (8,33)
- C. (6,12)
- D. (4,23)

Question 9

Noah's training time fits $T = -0.5w + 30$, where T is minutes and w is weeks. For which w does the model predict 24 minutes?

- A. $w = 6$
- B. $w = 3$
- C. $w = -12$
- D. $w = 12$

Question 10

A model is built from data for $x = 2$ to $x = 10$. Which prediction is least reliable?

- A. $x = 5$
- B. $x = 7$
- C. $x = 40$
- D. $x = 9$

Answer key

1. **D** - All gaps are less than 1 cm, so the line follows the trend. A line does not need to touch every point to fit well.
2. **B** - Slope is rise over run: $\frac{20-8}{6-2} = \frac{12}{4} = 3$. Dividing run by rise gives the reciprocal $\frac{1}{3}$.
3. **A** - From $20 = 4(3) + b$, $b = 8$. Using 12 forgets to subtract 4×3 from 20.
4. **B** - The slope is the change in cost for each 1-unit increase in hours. The fixed fee is the intercept, 15.
5. **C** - The y-intercept is the value of C when $h = 0$. After 1 hour the model gives $2.5(1) + 15 = 17.5$, not 15.
6. **D** - $2.5(4) + 15 = 10 + 15 = 25$. Forgetting the fixed fee gives .
7. **A** - The points rise, level off, and fall, so a line misses the middle points by up to 16 feet. A positive slope is not a flaw by itself.
8. **C** - At week 6 the line predicts 28, but the point is at 12, a gap of 16. The other points are within 2 of the line.
9. **D** - $-0.5w + 30 = 24$ gives $-0.5w = -6$, so $w = 12$. Dividing by 0.5 incorrectly gives 3.
10. **C** - A prediction far outside the range of the data (extrapolation) is least reliable. The others are inside the range.

Remember:

- Standards 8.SP.A.2 and 8.SP.A.3: fit a line informally, judge the fit, and interpret the equation of a linear model.
- A good line has points close to it on both sides; a curve or wide scatter means a line is a poor model.
- Slope = change in y per 1 unit of x; y-intercept = predicted y when $x = 0$.
- Find the equation from two points on the line, not necessarily data points.
- Predictions inside the data range are more reliable than predictions far outside it.