

SAT Two-Variable Data Worksheet

Name: _____ Date: _____

Circle one answer for each question. Use the blank space for calculations. A calculator is allowed.

- 1. A line of best fit for a set of data is $y = 2.5x + 12$, where x is the number of hours a student studied and y is the student's quiz score. What quiz score does the line predict for a student who studied 6 hours?**

A. 15

B. 18

C. 24

D. 27
- 2. A café models its daily hot chocolate sales with $y = -4.2x + 150$, where y is the number of cups sold and x is the day's high temperature, in degrees Fahrenheit. What is the best interpretation of -4.2 in this context?**

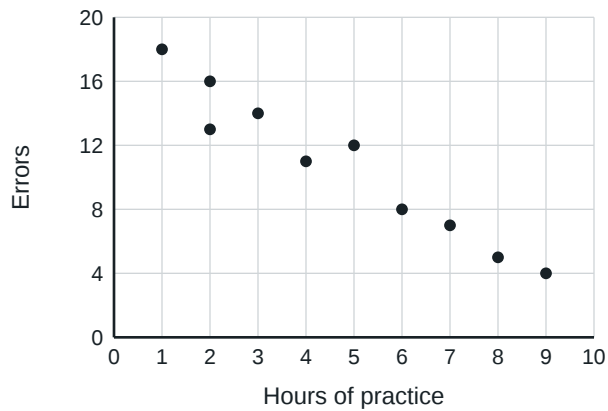
A. The café sells 4.2 cups of hot chocolate each day.

B. For each 1° increase in the high temperature, the model predicts 4.2 fewer cups sold.

C. For each additional cup sold, the model predicts a high temperature 4.2° lower.

D. When the high temperature is 0° , the model predicts 4.2 cups sold.

3.



The scatterplot shows hours of practice and the number of errors on a typing test for 10 students. Which statement best describes the data?

- A. As practice increases, errors tend to increase.
- B. Errors stay about the same as practice increases.
- C. As practice increases, errors tend to decrease.
- D. Every student with more practice made fewer errors than every student with less practice.

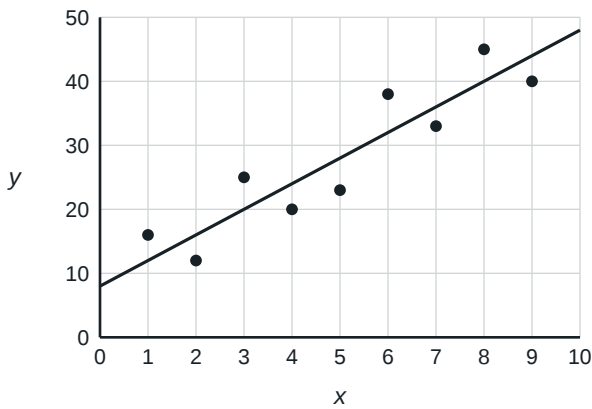
4. **A biologist used data on trees that were 5 to 40 years old to find a line of best fit for tree height and age. For which tree age is a prediction from this line least reliable?**

- A. 8 years
- B. 20 years
- C. 35 years
- D. 90 years

5. **A line of best fit for a data set is $y = 3.1x + 5$. The data set includes the point (10, 38). How much greater is the actual y-value of this point than the y-value the line predicts?**

- A. 2
- B. 3.1
- C. 33
- D. 36

6.



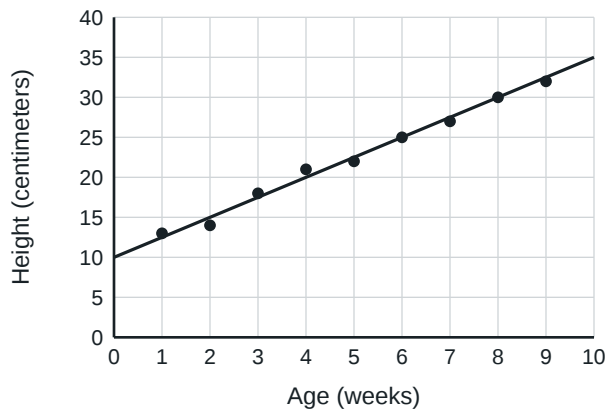
The scatterplot shows 9 data points and a line of best fit. For how many of the data points is the actual y -value greater than the y -value predicted by the line of best fit?

- A. 3
- B. 4
- C. 5
- D. 9

7. A line of best fit for data on used cars is $y = -1,800x + 24,000$, where y is a car's estimated value, in dollars, and x is the car's age, in years. What is the best interpretation of 24,000 in this context?

- A. The estimated decrease in a car's value each year, in dollars
- B. The age, in years, at which a car's estimated value is \$0
- C. The estimated value, in dollars, of a car that is 0 years old
- D. The actual value of every new car in the data, in dollars

8.



The scatterplot shows the age and height of 9 sunflower seedlings, along with a line of best fit. Which equation best represents the line of best fit, where y is the height, in centimeters, and x is the age, in weeks?

- A. $y = 2.5x + 10$
- B. $y = 10x + 2.5$
- C. $y = 0.4x + 10$
- D. $y = -2.5x + 10$

9.

x	y
0	200
1	240
2	288
3	346

The table shows the number of members y in an online group x months after the group started. Which equation best models the data?

- A. $y = 200(1.2)^x$
- B. $y = 200 + 40x$
- C. $y = 200(0.8)^x$
- D. $y = 240(1.2)^x$

10. The function $f(x) = 850(0.92)^x$ models the number of fish in a lake x years after 2020. According to the model, how does the number of fish change each year?
- A. It decreases by 0.92%.
 - B. It decreases by 8%.
 - C. It decreases by 92%.
 - D. It increases by 8%.
11. A scientist models the number of cells in a sample t hours after it was prepared with the function $P(t) = a(b^t)$, for positive constants a and b . The model gives $P(0) = 500$ and $P(2) = 4,500$. What does the model predict for $P(4)$?
- A. 8,500
 - B. 13,500
 - C. 40,500
 - D. 121,500
12. The line of best fit for a data set is $y = 4x + 7$. A new data set is made by adding 3 to every y -value in the original data set and keeping the x -values the same. Which equation is the line of best fit for the new data set?
- A. $y = 4x + 7$
 - B. $y = 7x + 7$
 - C. $y = 12x + 21$
 - D. $y = 4x + 10$

Answer key

1 **D** · 2 **B** · 3 **C** · 4 **D** · 5 **A** · 6 **B** · 7 **C** · 8 **A** · 9 **A** · 10 **B** · 11 **C** · 12 **D**

1. D: 27

Substitute $x = 6$: $2.5(6) + 12 = 15 + 12 = 27$. Choice A leaves out the 12.

2. B: For each 1° increase in the high temperature, the model predicts 4.2 fewer cups sold.

The slope, -4.2 , is the change in predicted cups sold for each 1° increase in the high temperature. The negative sign means fewer cups on warmer days. Choice D describes the y-intercept, which is 150.

3. C: As practice increases, errors tend to decrease.

The points fall from left to right in a roughly straight pattern, so errors tend to decrease as practice increases. Choice D is too strong: a student with 3 hours of practice made more errors than a student with 2 hours.

4. D: 90 years

Ages 8, 20, and 35 are inside the 5-to-40-year range of the data. At 90 years the line is used far outside that range, where the data give no evidence that the same trend holds.

5. A: 2

At $x = 10$, the line predicts $3.1(10) + 5 = 36$. The actual value, 38, is $38 - 36 = 2$ greater. Choice D is the predicted value itself.

6. B: 4

A point has an actual value greater than the prediction when it lies above the line. Four points lie above the line, at $x = 1, 3, 6$, and 8. The other 5 lie below it.

7. C: The estimated value, in dollars, of a car that is 0 years old

When $x = 0$, $y = 24,000$, so 24,000 is the estimated value, in dollars, of a car that is 0 years old. Choice A describes the slope, $-1,800$. Choice D is too strong because the line gives estimates, not the value of each car.

8. A: $y = 2.5x + 10$

The line crosses the y -axis at 10 and rises to 35 at $x = 10$, a slope of $\frac{25}{10} = 2.5$. Choice B swaps the slope and the y -intercept, and choice C divides the change in x by the change in y .

9. A: $y = 200(1.2)^x$

Each value is about 1.2 times the one before: $\frac{240}{200} = 1.2$ and $\frac{288}{240} = 1.2$. With 200 members at $x = 0$, the model is $y = 200(1.2)^x$. Choice B fits the first two rows, but it predicts 280 at $x = 2$, not 288.

10. B: It decreases by 8%.

Each year the number of fish is multiplied by 0.92, which keeps 92% of the fish and removes 8%. So the model predicts an 8% decrease each year.

11. C: 40,500

$P(0) = a$, so $a = 500$. Then $500b^2 = 4,500$, so $b^2 = 9$ and $b = 3$. The prediction is $P(4) = 500(3^4) = 500(81) = 40,500$. Choice A assumes the count grows by the same amount each hour.

12. D: $y = 4x + 10$

Adding 3 to every y -value moves every point up 3 units without changing their pattern, so the line moves up 3 units too. The slope stays 4, and the y -intercept becomes $7 + 3 = 10$.