

AP Statistics · Regression Analysis · Worksheet

Common Core AP Statistics Unit 5 (2026-27) · mathovore.fr

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

This ap statistics two variable worksheet gives 22 problems on regression analysis, ordered from easy to hard, with a separate answer key.

These 22 problems practice AP Statistics Unit 5 (2026-27): scatterplots, correlation, least-squares lines, interpreting slope, intercept and r squared, residuals, residual plots, influential points and extrapolation.

Early problems are single skills. The last six use realistic contexts and several steps, so write every interpretation in context.

AP StatisticsCommon Core: AP Statistics Unit 5 (2026-27)

AP Statistics Two Variable Worksheet: problems 1-5

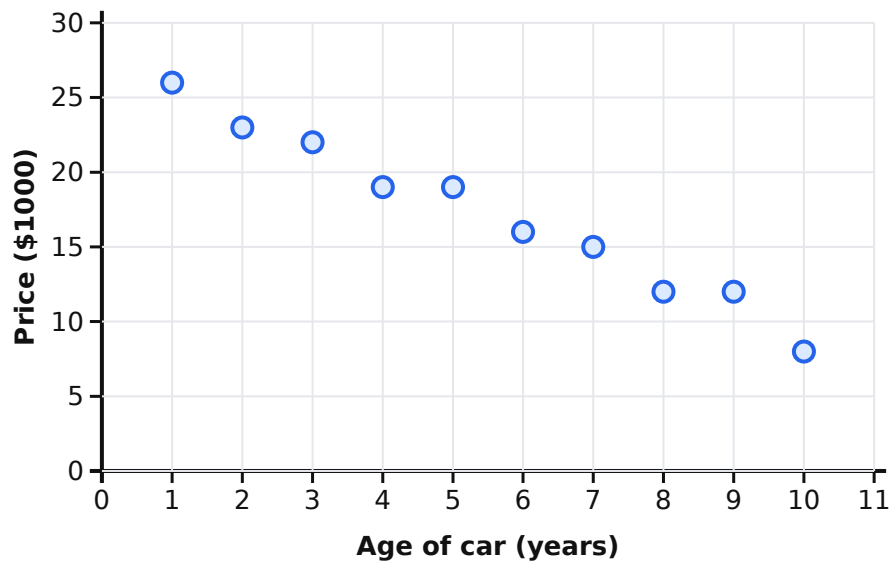
Problem 1: Explanatory and response variables

Identify the explanatory variable and the response variable in each situation.

- A teacher predicts a student's exam score from the hours the student studied.
- A dealer predicts a used car's selling price from the car's age.

Problem 2: Describe a scatterplot

The scatterplot shows the price and age of 10 used cars of the same model.



Price and age for 10 used cars of the same model.

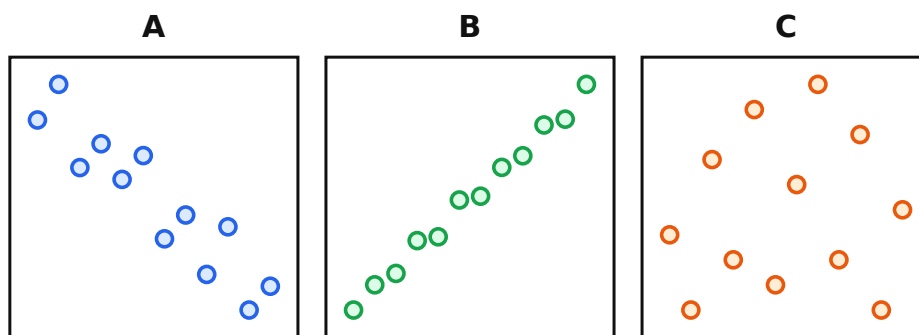
Describe the association in context: direction, form, strength and unusual points.

Problem 3: Plot and describe data

Six players recorded their weekly practice time x (hours) and the number y of free throws made out of 10: (1, 3), (2, 4), (3, 4), (4, 6), (5, 7), (6, 9). Make a scatterplot and describe the association.

Problem 4: Match correlations to graphs

Match each correlation to its scatterplot: $r = 0.996$, $r = 0.10$ and $r = -0.92$.



Three scatterplots (not drawn to the same scale).

Problem 5: Properties of correlation

The correlation between the height and the arm span of students measured in inches is $r = 0.91$.

- Describe the strength and direction.
- How does r change if both variables are measured in centimeters?
- Can a correlation be 1.3? Explain.

AP Statistics Two Variable Worksheet: problems 6-10

Problem 6: Compute the correlation

Five values of x and y are (1, 3), (2, 4), (4, 5), (5, 9), (8, 9). The means are 4 and 6, and the sample standard deviations are 2.74 and 2.83. Use z-scores to find r .

Problem 7: Slope and intercept from statistics

For a set of data, $\bar{x}=40$, $s_x=8$, $\bar{y}=120$, $s_y=20$ and $r=0.6$. Find the equation of the least-squares line.

Problem 8: Make a prediction

Maya's exercise log gives the line $\hat{y}=12.4+3.1x$, where x is minutes of exercise (10 to 60) and y is calories burned. Predict the calories burned for 20 minutes and for 45 minutes.

Problem 9: Interpret the slope

A regression of the selling price y (in thousands of dollars) on the age x (in years) of used cars gives $\hat{y}=24.8-1.9x$. Interpret the slope in context.

Problem 10: Interpret the intercept

The model $\hat{y}=30.5+2.6x$ predicts a child's height y (inches) from age x (years), using data for ages 3 to 10. Interpret the intercept. Is it meaningful?

AP Statistics Two Variable Worksheet: problems 11-15

Problem 11: Interpret r^2 squared

A linear model relates hours studied to exam score, with $r^2=0.81$ and a positive slope.

- Interpret r^2 in context.
- Find the correlation r .
- If another model had $r=-0.8$, what would r^2 be?

Problem 12: Compute a residual

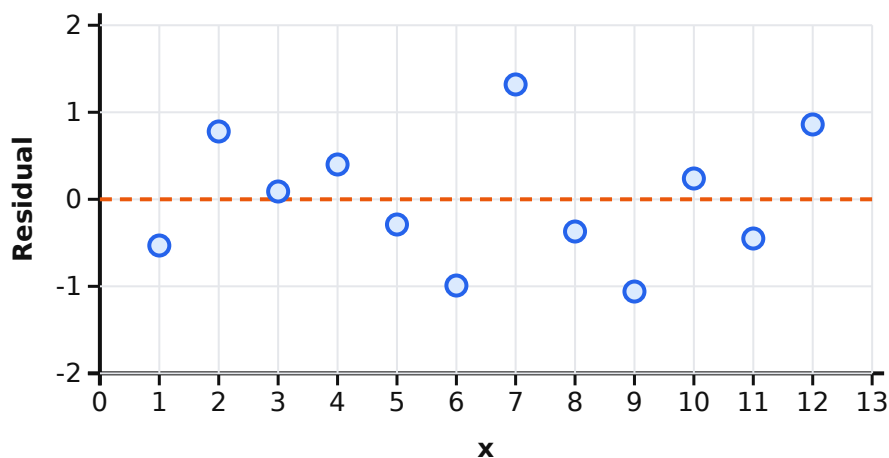
A model for test score y from hours studied x is $\hat{y}=48.5+3.2x$. Jamal studied 7 hours and scored 78. Find the residual.

Problem 13: Meaning of a residual

Use $\hat{y} = 24.8 - 1.9x$ (price y in thousands of dollars, age x in years). A 6-year-old car sold for \$9,200. Find and interpret the residual.

Problem 14: Read a residual plot

The residual plot comes from a least-squares line fit to 12 points.



Residual plot from a least-squares line.

Is a linear model appropriate? Explain.

Problem 15: Computer regression output

A statistics package regressed exam score on hours studied for a class. Part of the output is shown.

Predictor	Coef
Constant	12.35
Hours	4.62

$S = 5.10$ $R\text{-Sq} = 72.4\%$

- Write the regression equation.
- Find the correlation r .
- Interpret $S = 5.10$.

AP Statistics Two Variable Worksheet: problems 16-20

Problem 16: Regression line from data

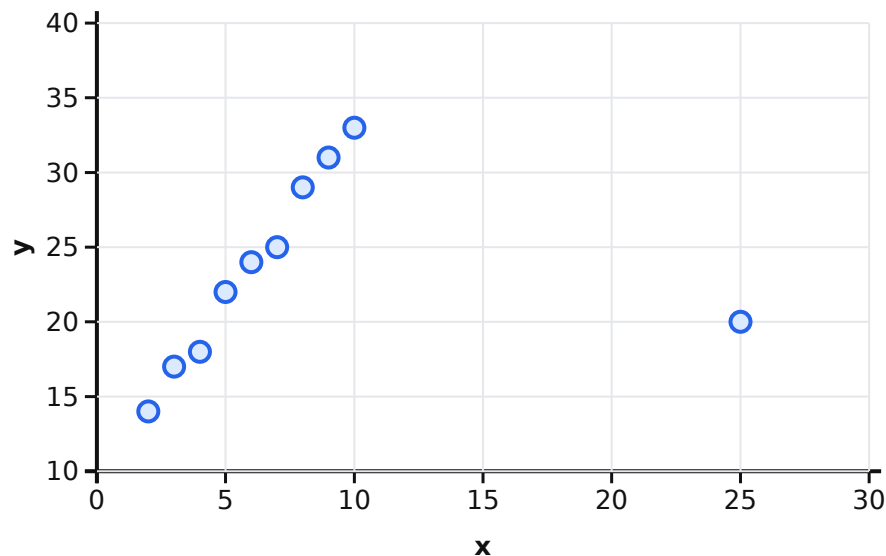
The pairs (x, y) are $(2, 4)$, $(3, 6)$, $(5, 7)$, $(6, 11)$, $(8, 12)$, $(9, 16)$. Find the least-squares regression line, with the slope and intercept to the nearest hundredth.

Problem 17: Extrapolation

Ethan measured his bean plant each day for 14 days and found $\hat{y} = 2.1 + 0.9x$, where x is the day and y is the height in inches. He uses the line to predict the height on day 60. Find the prediction and explain why it is unreliable.

Problem 18: Influential point

A scatterplot of ten points is shown.



Nine points follow an upward line; the tenth, at $(25, 20)$, is far to the right.

- Which point is likely to be influential? Explain.
- Predict how the slope and r change if that point is removed.

Problem 19: Residuals for a small data set

The least-squares line for $(1, 2)$, $(2, 5)$, $(3, 4)$, $(4, 7)$, $(5, 8)$, $(6, 9)$ is $\hat{y} = 1.13 + 1.34x$. Find all six residuals, check that they sum to about 0, and find the point with the largest residual in absolute value.

Problem 20: Complete regression analysis

Priya recorded hours studied x and quiz score y for 8 quizzes: $(0.5, 52)$, $(1, 55)$, $(1.5, 61)$, $(2, 63)$, $(2.5, 70)$, $(3, 72)$, $(3.5, 79)$, $(4, 84)$. The summary statistics are $\bar{x} = 2.25$, $s_x \approx 1.225$, $\bar{y} = 67$, $s_y \approx 11.15$ and $r \approx 0.994$.

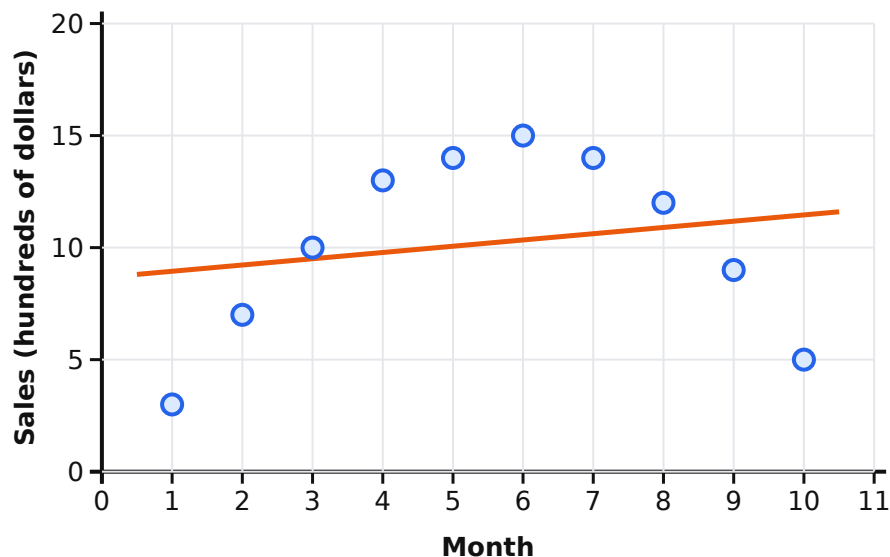
- Find the least-squares line.

- Interpret the slope.
- Find r^2 and interpret it.
- Find the residual for the quiz with 2.5 hours.

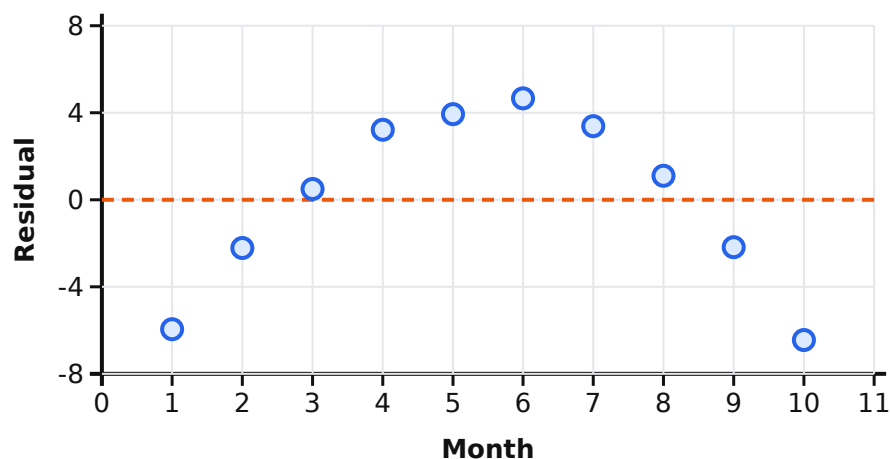
AP Statistics Two Variable Worksheet: problems 21-22

Problem 21: Curved pattern

A farmers market stand's monthly sales (in hundreds of dollars) for 10 months are graphed with the least-squares line, and the residuals are plotted below.



Monthly sales at a farmers market stand over 10 months.



The residual plot has a clear curve.

Is a linear model appropriate? Use both graphs to explain. The correlation is $r \approx 0.20$.

Problem 22: Laptop resale value

For used laptops, the age x (years) and the resale value y (in hundreds of dollars) have $\bar{x}=2.8$, $s_x=1.0$, $\bar{y}=5.6$, $s_y=2.0$ and $r=-0.90$.

- Find the least-squares line.
- Interpret the slope in context.
- Predict the value of a 4-year-old laptop.
- A 4-year-old laptop is listed at \$420. Find its residual and interpret it.
- Find r^2 and interpret it.

How to use this ap statistics two variable worksheet

Print this ap statistics two variable worksheet as a PDF, solve every problem on paper, then compare with the answer key.

