

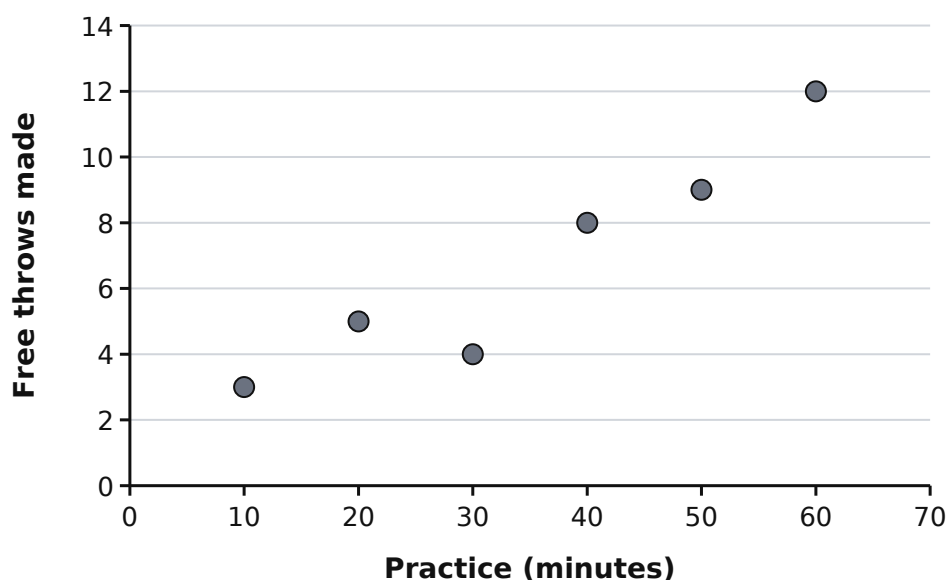
AP Statistics - Scatterplots and Correlation - Test Answer Key

Common Core AP STAT 2.4, AP STAT 2.5, HSS-ID.B.6, HSS-ID.C.8, HSS-ID.C.9 · maths-pdf.fr/en/

Each solution has a scoring guide. Give credit for the four parts of a scatterplot description, for correct arithmetic, and for explanations that mention context and the limits of correlation.

AP Statistics · Common Core State Standards: **AP STAT 2.4, AP STAT 2.5, HSS-ID.B.6, HSS-ID.C.8, HSS-ID.C.9**

Question 1 - Describe a scatterplot [4 pts]



Minutes of practice and free throws made.

Direction: positive. Form: linear. Strength: strong ($r = 0.951$). Unusual features: none.

Positive, linear, strong association ($r = 0.951$), with no outliers: more practice goes with more free throws.

Scoring: 1 point each for direction, form, strength, and context/unusual features.

Question 2 - Compute r [3 pts]

z-scores of x : -1.265, -0.632, 0, 0.632, 1.265. z-scores of y : -1.433, -0.187, 0.125, 0.125, 1.371.

The sum of products divided by 4 gives $r = 0.936$.

$r = 0.936$.

Scoring: 1 point for z-scores, 1 point for the products and sum, 1 point for r .

Question 3 - Interpret and units [3 pts]

(a) Strong negative linear association: older cars tend to cost less.

(b) r stays -0.91.

(c) No, correlation alone does not prove causation.

Strong negative; unchanged; no.

Scoring: 1 point per part.

Question 4 - r and curved data [2 pts]

r measures only linear association.

The variables are strongly related in a curved way. A near-zero r only means no linear association.

Scoring: 1 point for linear-only, 1 point for noting the curved relationship.

Question 5 - Outlier effect [2 pts]

The point was far from the linear trend and weakened it.

Removing the outlier strengthens the linear pattern, so r increases. Correlation is not resistant.

Scoring: 1 point for identifying the outlier effect, 1 point for r not resistant.

Question 6 - Lurking variable [2 pts]

Fire size drives both the number of firefighters and the damage.

Fire size is a lurking variable.

Scoring: 1 point for rejecting causation, 1 point for naming the lurking variable.

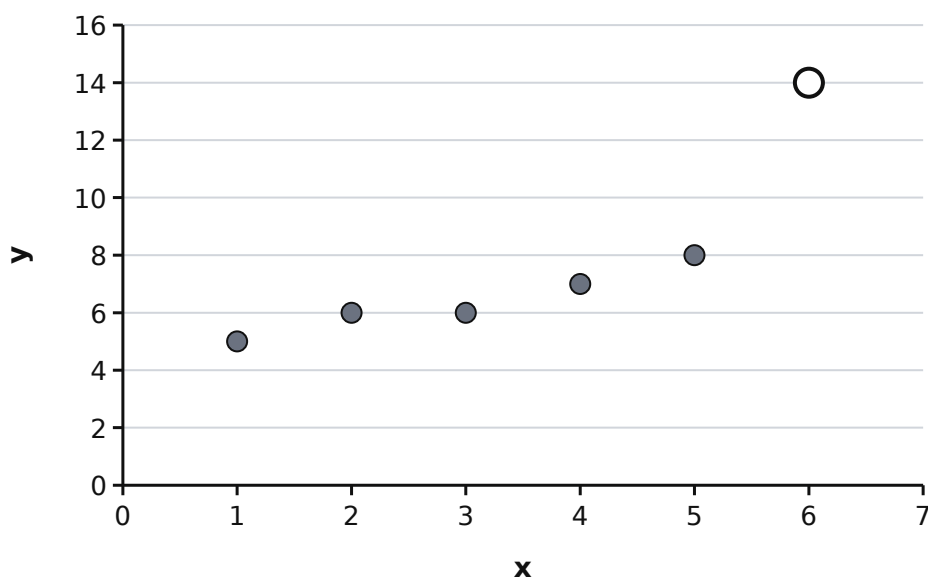
Question 7 - Match plots [2 pts]

$|r|$ values: 0.95, 0.2, 0, 0.7.

0, -0.2, -0.7, 0.95.

Scoring: 2 points for a correct order; 1 point if one pair is swapped.

Question 8 - Unusual point [2 pts]



A scatterplot with an unusual point.

The point (6, 14) is far above the pattern formed by the other points.

It lowers r because it lies away from the linear trend.

Scoring: 1 point for identifying (6, 14), 1 point for the effect on r .

Total

20 points