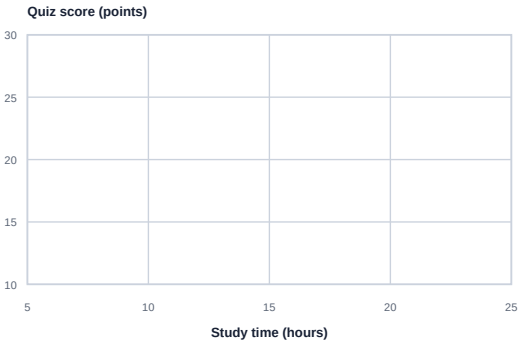


Scatterplots and Correlation

Use the labeled paired observations. Describe form and direction before calculating Pearson r ; round r to the nearest thousandth. Association alone does not establish causation.

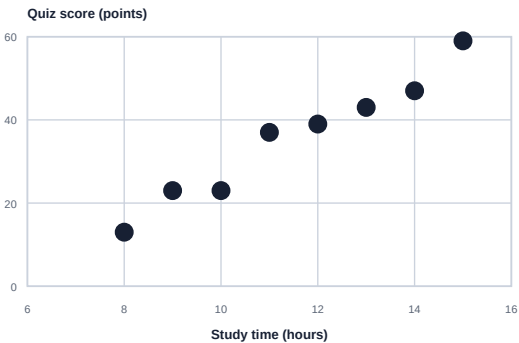
1. Plot every ordered pair on the blank axes, then describe the direction and form.

x: Study time (hours)	9	11	13	15	17	19	21	23
y: Quiz score (points)	17	21	23	29	25	19	27	15



2. Interpret Pearson $r = 0.980$ in context. State what the data do and do not justify.

x: Study time (hours)	8	9	10	11	12	13	14	15
y: Quiz score (points)	13	23	23	37	39	43	47	59

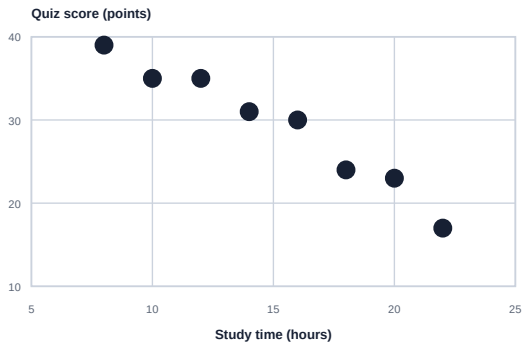


Scatterplots and Correlation

Use the labeled paired observations. Describe form and direction before calculating Pearson r ; round r to the nearest thousandth. Association alone does not establish causation.

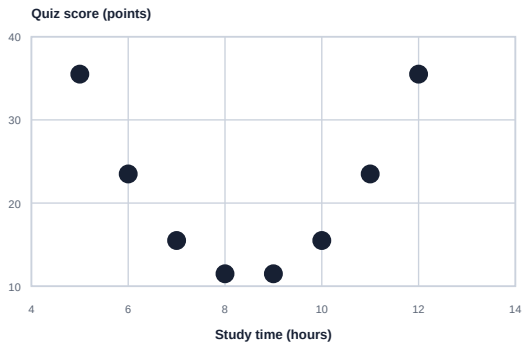
3. Calculate Pearson's correlation coefficient r from the displayed pairs.

x: Study time (hours)	8	10	12	14	16	18	20	22
y: Quiz score (points)	39	35	35	31	30	24	23	17



4. Use the supplied scatterplot to describe its direction and whether its form is linear or nonlinear.

x: Study time (hours)	5	6	7	8	9	10	11	12
y: Quiz score (points)	35.5	23.5	15.5	11.5	11.5	15.5	23.5	35.5

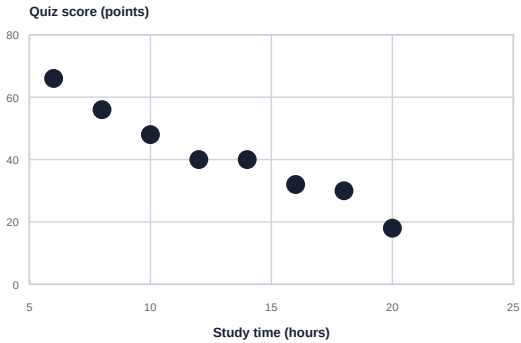


Scatterplots and Correlation

Use the labeled paired observations. Describe form and direction before calculating Pearson r ; round r to the nearest thousandth. Association alone does not establish causation.

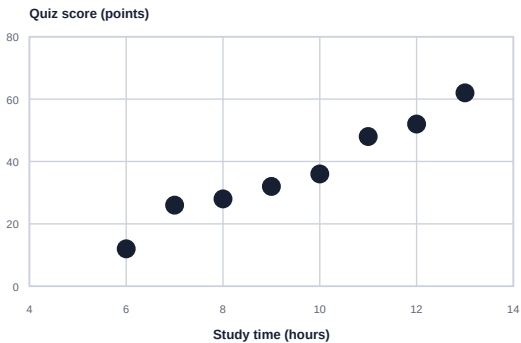
5. Calculate Pearson's correlation coefficient r from the displayed pairs.

x: Study time (hours)	6	8	10	12	14	16	18	20
y: Quiz score (points)	66	56	48	40	40	32	30	18



6. Interpret Pearson $r = 0.983$ in context. State what the data do and do not justify.

x: Study time (hours)	6	7	8	9	10	11	12	13
y: Quiz score (points)	12	26	28	32	36	48	52	62



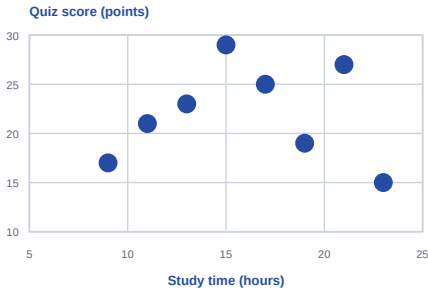
Scatterplots and Correlation

Worked Answer Key

Use the labeled paired observations. Describe form and direction before calculating Pearson r ; round r to the nearest thousandth. Association alone does not establish causation.

1. Plot every ordered pair on the blank axes, then describe the direction and form.

x: Study time (hours)	9	11	13	15	17	19	21	23
y: Quiz score (points)	17	21	23	29	25	19	27	15

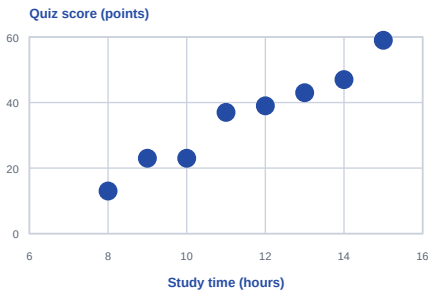


Answer: Completed plot; little or no linear association ($r = 0.000$).

1. Use each table row as one ordered pair (x, y) ; label both axes with variables and units.
2. The completed plot shows little or no linear association ($r = 0.000$).
3. Classroom convention: $|r| < 0.20$ little or no, 0.20-0.39 weak, 0.40-0.69 moderate, and 0.70-1.00 strong linear association.

2. Interpret Pearson $r = 0.980$ in context. State what the data do and do not justify.

x: Study time (hours)	8	9	10	11	12	13	14	15
y: Quiz score (points)	13	23	23	37	39	43	47	59



Answer: strong positive linear association ($r = 0.980$). This is association, not evidence that study time causes the scores.

1. Classroom convention: $|r| < 0.20$ little or no, 0.20-0.39 weak, 0.40-0.69 moderate, and 0.70-1.00 strong linear association. By that convention these data show strong positive linear association ($r = 0.980$).
2. Correlation does not establish causation; lurking variables and study design still matter.
3. An r near 0 means little linear association, not independence; nonlinear dependence may remain.

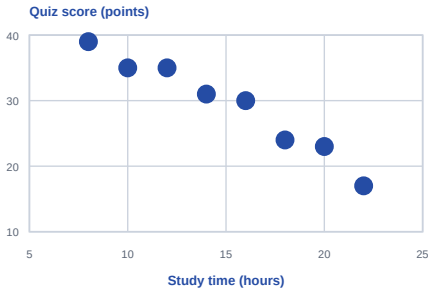
Scatterplots and Correlation

Worked Answer Key

Use the labeled paired observations. Describe form and direction before calculating Pearson r ; round r to the nearest thousandth. Association alone does not establish causation.

3. Calculate Pearson's correlation coefficient r from the displayed pairs.

x: Study time (hours)	8	10	12	14	16	18	20	22
y: Quiz score (points)	39	35	35	31	30	24	23	17

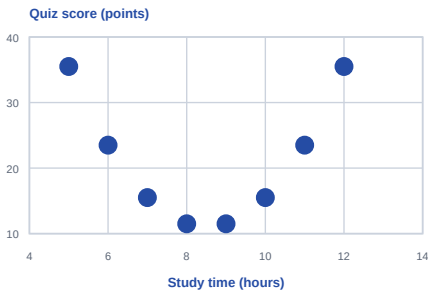


Answer: $r = -0.980$

1. $\bar{x} = 15.000$, $\bar{y} = 29.250$; $S_{xx} = 168.000$, $S_{yy} = 381.500$, and $S_{xy} = -248.000$.
2. $r = S_{xy} / \sqrt{S_{xx} \times S_{yy}} = -0.980$ (rounded only here at the final answer).
3. Pearson r measures the direction and strength of linear association.

4. Use the supplied scatterplot to describe its direction and whether its form is linear or nonlinear.

x: Study time (hours)	5	6	7	8	9	10	11	12
y: Quiz score (points)	35.5	23.5	15.5	11.5	11.5	15.5	23.5	35.5



Answer: a clear U-shaped nonlinear association ($r = 0.000$)

1. The points fall and then rise, so a straight-line direction alone misses the U-shaped form.
2. Classroom convention: $|r| < 0.20$ little or no, 0.20-0.39 weak, 0.40-0.69 moderate, and 0.70-1.00 strong linear association.
3. A visual description concerns association in these observations; it does not establish a cause.

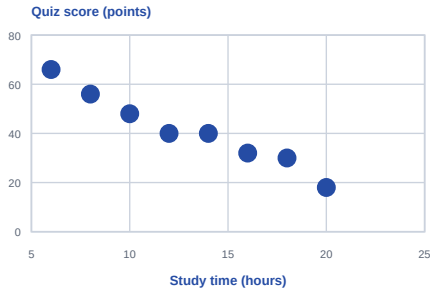
Scatterplots and Correlation

Worked Answer Key

Use the labeled paired observations. Describe form and direction before calculating Pearson r ; round r to the nearest thousandth. Association alone does not establish causation.

5. Calculate Pearson's correlation coefficient r from the displayed pairs.

x: Study time (hours)	6	8	10	12	14	16	18	20
y: Quiz score (points)	66	56	48	40	40	32	30	18

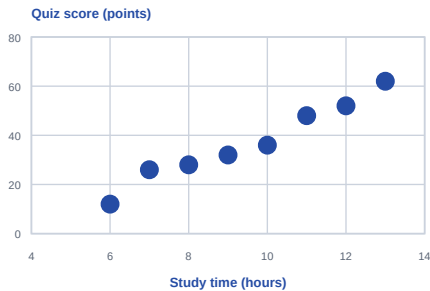


Answer: $r = -0.982$

1. $\bar{x} = 13.000$, $\bar{y} = 41.250$; $S_{xx} = 168.000$, $S_{yy} = 1631.500$, and $S_{xy} = -514.000$.
2. $r = S_{xy} / \sqrt{S_{xx} \times S_{yy}} = -0.982$ (rounded only here at the final answer).
3. Pearson r measures the direction and strength of linear association.

6. Interpret Pearson $r = 0.983$ in context. State what the data do and do not justify.

x: Study time (hours)	6	7	8	9	10	11	12	13
y: Quiz score (points)	12	26	28	32	36	48	52	62



Answer: strong positive linear association ($r = 0.983$). This is association, not evidence that study time causes the scores.

1. Classroom convention: $|r| < 0.20$ little or no, 0.20-0.39 weak, 0.40-0.69 moderate, and 0.70-1.00 strong linear association. By that convention these data show strong positive linear association ($r = 0.983$).
2. Correlation does not establish causation; lurking variables and study design still matter.
3. An r near 0 means little linear association, not independence; nonlinear dependence may remain.