Direction/form/strength of association

6 questions | 18 marks

Equivalent correct methods earn the corresponding marks.

1. Describe direction, form and strength for (1,10), (2,8), (3,6), (4,4). [3 marks]

Paired measurements

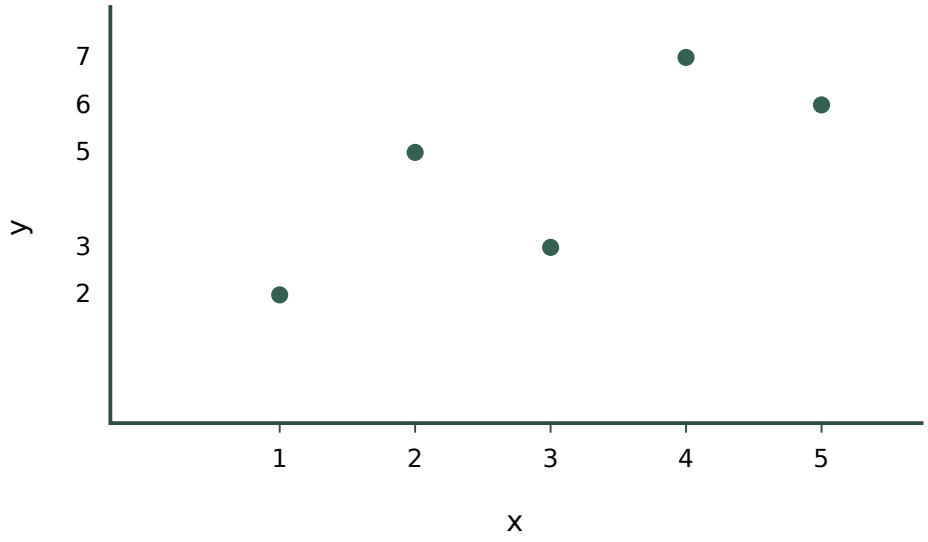
x	y
1	10
2	8
3	6
4	4

Each one-unit rise in x reduces y by 2.

All points lie exactly on y=12-2x.

Answer: Perfect negative linear association.

2. Describe the supplied pairs (1,2), (2,5), (3,3), (4,7), (5,6). [3 marks]



The overall response increases as x increases.

It is not exact and no strong curvature is evident.

Answer: Positive, roughly linear association with visible scatter.

3. A scatter plot rises sharply but its points are widely scattered. Is “strong because it is steep” valid? [3 marks]

Slope and strength describe different features.

Assess closeness to the trend, not just steepness.

Answer: No. Wide scatter can indicate weak linear association despite a steep trend.

4. What form is suggested by (0,1), (1,2), (2,4), (3,8)? [3 marks]

Paired measurements

x	y
0	1
1	2
2	4
3	8

Successive y-values double.

The increase is not constant, so a straight line is not the natural form.

Answer: Positive nonlinear, exponential-looking association.

5. The U-shaped data (-2,4), (-1,1), (0,0), (1,1), (2,4) have r=0. Is there no relationship? [3 marks]

The increasing and decreasing sections balance the linear correlation.

Inspect the graph; r only summarises a straight-line tendency.

Answer: No. There is a strong nonlinear relationship $y=x^2$.

6. Two graphs show the same data but use centimetres and metres on the vertical axes. Should their correlation strengths differ? [3 marks]

Every vertical value is multiplied by the same positive constant.

The display’s apparent steepness can change while r stays the same.

Answer: No. A positive unit conversion does not change the association strength.