

Scatter Plots and Two-Way Tables: math practice, Grade 8 – download the PDF

21 problems graded by difficulty (★ easy, ★★ medium, ★★★ hard). Try first, without looking at the solutions!

1 Plot and describe



A lemonade stand recorded the afternoon temperature (in °F) and the number of cups sold.

Temperature x	60	65	70	75	80	85
Cups sold y	12	15	22	26	33	38

- Which variable goes on the horizontal axis? Why?
- Write the first and last ordered pairs.
- Describe the association.

2 Name that association



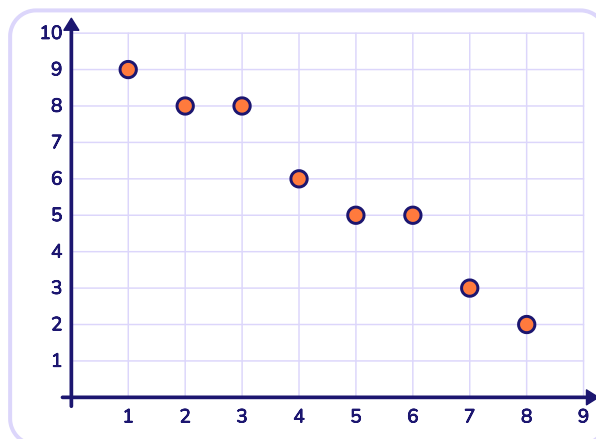
Tell whether each pair of variables most likely has a positive association, a negative association, or no association.

- a. Age of a car and its resale value.
- b. Shoe size and score on a math quiz.
- c. Hours of basketball practice and free throws made.
- d. Distance walked and time spent walking at a steady pace.
- e. Days absent and course grade.

3 Reading a scatter plot



Each point shows one used bike: age in years (horizontal) and price in hundreds of dollars (vertical).



- a. Describe the association.
- b. What is the price of the 4-year-old bike?
- c. How many bikes cost more than 500 dollars?

4

Complete the totals

Forty students were asked how they get to school and whether they play soccer.

	Walk	Bus	Total
Plays soccer	14	9	?
Does not play soccer	6	11	?
Total	?	?	?

Find the four missing totals.

5

Spot the outlier

A student tracked the total pages read after each day.

Day x	1	2	3	4	5	6	7
Pages y	12	25	36	48	11	73	85

One pair does not fit the pattern. Which one is the outlier? Explain.

6

Slope of a trend line

A trend line for the height of a sunflower (in centimeters) after x weeks passes through $(1, 15)$ and $(5, 35)$.

- Find the slope.
- Find the y-intercept.
- Write the equation of the line.

7

Use the equation

A band director models the number of songs a group has memorized with $y = 3x + 8$, where x is the number of weeks of rehearsal.

- Predict the number of songs after 10 weeks.
- After how many weeks does the model predict 50 songs?

8

Build the scatter plot

Eight students recorded their hours of sleep and the minutes they needed to solve a puzzle the next day.

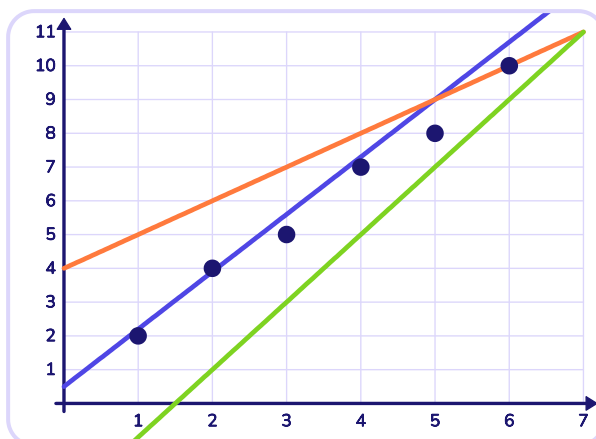
Sleep (h)	5	6	6.5	7	7.5	8	9	9.5
Minutes	42	38	35	31	30	26	22	20

- Describe the association.
- The line through $(6, 38)$ and $(9, 23)$ fits the data well. Find its equation.
- Predict the time for a student who sleeps 8.5 hours.

9 Which line fits best?



The graph shows six points and three lines: A (violet), B (orange), and C (green).



- Which line is the best line of fit?
- Explain why each of the other two lines fits poorly.

10 Interpolate or extrapolate?



A seedling was measured each week for 10 weeks. The trend line is $y = 4x + 12$, where y is height in centimeters and x is the week.

- Predict the height in week 7.
- Predict the height in week 30.
- Which prediction is more trustworthy? Why?

11 Scooter rentals



A trend line for scooter rental data is $y = 0.40x + 3$, where x is the ride time in minutes and y is the total cost in dollars.

- Interpret the slope.
- Interpret the y-intercept.
- How many minutes can you ride with 10 dollars?

12 Honor roll and band

Eighty students were surveyed.

	Honor roll	Not honor roll	Total
In band	18	12	?
Not in band	22	28	?
Total	?	?	80

- Complete the totals.
- Find the percent of band students who are on the honor roll.
- Find the percent of non-band students who are on the honor roll.
- Is there an association?

13 Fill in from clues

A survey of 60 students gives these facts: 35 ride the bus and 25 walk; 24 students have a pet; 14 of the bus riders have a pet. Build and complete the two-way table.

14

Cats or dogs?

Sixty seventh graders and fifty eighth graders chose a favorite pet.

	Cats	Dogs	Total
Grade 7	24	36	60
Grade 8	20	30	50

Is there an association between grade and favorite pet? Use relative frequencies.

15

The outlier effect

A pool sold season passes over seven weeks.

Week x	1	2	3	4	5	6	7
Passes y	12	16	19	24	28	32	5

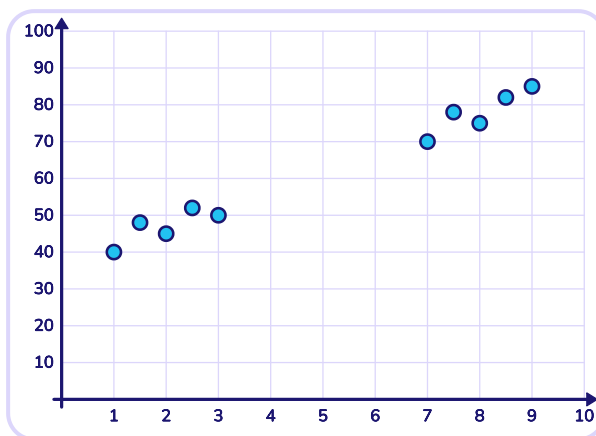
The first six weeks follow the line $y = 4x + 8$.

- Identify the outlier.
- What does the line predict for week 7?
- How far is the actual value from the prediction?
- Suggest a real-world reason for this outlier.

16 Two clusters



Each point shows a player: weekly practice hours (horizontal) and free throw success percent (vertical).



- Describe the clusters and the gap.
- A line is drawn through all the points. Would it predict the success of a player who practices 5 hours? Explain.

17 Resale value



The trend line for the resale value (in dollars) of a phone x years after purchase passes through $(1, 640)$ and $(4, 400)$.

- Find the equation.
- Interpret the slope and the y-intercept.
- When does the model predict a value of 0? Is that believable?

18 Fit your own line

Calories burned while jogging:

Minutes x	10	20	30	40	50	60
Calories y	95	190	310	385	500	590

- Describe the association.
- Choose two points on a line that follows the trend and find its equation.
- Predict the calories burned in 45 minutes.
- Interpret the slope.

19 Association in a table

Two hundred students were asked whether they play a sport and whether they feel rested in the morning.

	Rested	Not rested	Total
Plays a sport	66	34	100
No sport	48	52	100
Total	114	86	200

- Find the percent of sport players who feel rested and the percent of non-players who feel rested.
- Is there an association?
- Of the students who feel rested, what percent play a sport?

20

Relative frequency table

Five hundred students were surveyed about transportation and school start time. The table shows percents of all 500 students.

	Early start	Late start
Bus	18%	42%
Walk	12%	28%

- How many students are in each of the four cells?
- Among bus riders, what percent have an early start? Among walkers?
- Is there an association?

21

Cause or coincidence?

A town finds a strong positive association between the daily temperature x (in °F) and ice cream sales y (in dollars): $y = 1.5x - 60$.

- At what temperature does the model predict 0 sales?
- Interpret the slope.
- A news headline says: "Buy less ice cream to cool the town." Explain the flaw.

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