

Unit 4 Day 24 - Fit a Line to Data - Without a Calculator



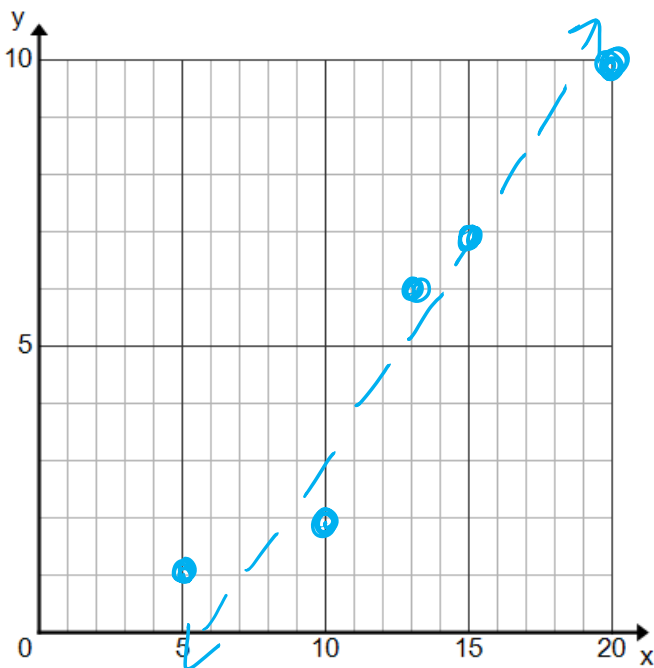
Create scatter plots and write equations to model data.

Line of Best Fit:

- When data shows a positive or negative correlation, you can model the trend in the data using a line of best fit.
- There should be approximately half the points _____ and half the points _____
- It can pass through some of the points, none of the points, or _____ of the points.

Example 1 (Without a calculator): Mrs. Berenson is really tired. The table shows the number of minutes spent in Foundations and the number of times she has yawned during the class period.

A. Graph the points below.



x	5	10	13	15	20
y	1	2	6	7	10

B. Does this describe a positive, negative, or no correlation? T

positive

C. What are the independent and dependent variables?

indep = min in class
dep = yawns

D. Use a ruler to draw your line of best fit as best as you can.

E. Choose two points on your line of best fit.

Point (15, 7) and Point (10, 3)

G. Use your line of best fit to predict how many times Mrs. Berenson will yawn in twelve minutes?

$$y = \frac{4}{5}x - 5$$

$$y = \frac{4}{5}(12) - 5$$

$$y = 4.6 \text{ yawns}$$

F. Write an equation in point-slope form. and then

convert to slope-intercept form.

$$m = \frac{7-3}{15-10} = \frac{4}{5}$$

$$5[y-3] = \left[\frac{4}{5}(x-10)\right]$$

$$5y-15 = 4(x-10)$$

$$5y-15 = 4x-40$$

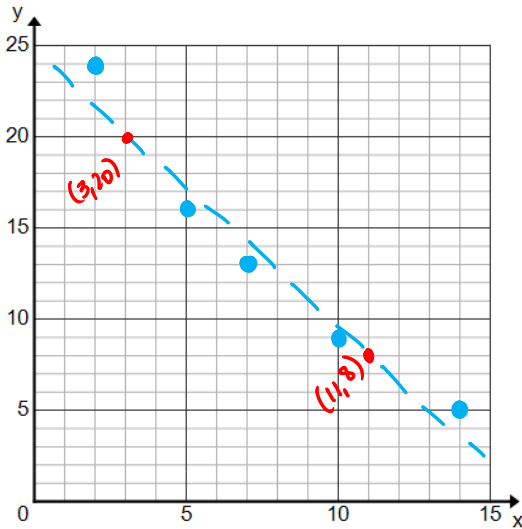
$$\begin{array}{r} 5y-15 = 4x-40 \\ +15 \quad \quad +15 \\ \hline 5y = 4x-25 \end{array}$$

$$\boxed{y = \frac{4}{5}x - 5}$$

Example 2 (Without a calculator): The table shows the number of flaming hot Cheetos in Mr. McNiff's bag and the number of minutes spent in Foundations.

A. Graph the points below.

x	2	5	7	10	14
y	24	16	13	9	5



B. Does this describe a positive, negative, or no correlation?

negative

C. What are the independent and dependent variables?

indep = # of min class

dep = # cheetos

D. Use a ruler to draw a line of best fit.

E. Choose two points on your line of best fit.

Point (3, 20) and Point (11, 8)

F. Write an equation in point-slope form and then

convert to slope-intercept form.

$$m = \frac{8-20}{11-3} = \frac{-12}{8} = -\frac{3}{2}$$

$$y = -\frac{3}{2}x + 24.5$$

$$\begin{aligned} 2(y-8) &= \left(-\frac{3}{2}(x-11)\right) \\ 2y-16 &= -3(x-11) \\ 2y-16 &= -3x+33 \\ 2y &= -3x+49 \end{aligned}$$

G. What does the slope represent?

$-\frac{3}{2}$ Every 2 min, he eats 3 more cheetos.

H. What does the y-intercept represent?

(0, 24.5)

At the start of class (0 min) there are about 24 cheetos in the bag

I. How many cheetos are left after 15 min?

$$\begin{aligned} y &= -\frac{3}{2}x + 24.5 \\ &= -\frac{3}{2}(15) + 24.5 \\ &= 2 \text{ cheetos} \end{aligned}$$

J. If there are 11 cheetos left, how long have

students been in class?

$$\begin{aligned} y &= -\frac{3}{2}x + 24.5 \\ 11 &= -\frac{3}{2}x + 24.5 \end{aligned}$$

$$\begin{aligned} -13.5 &= -\frac{3}{2}x \\ x &= 9 \end{aligned}$$

9 minutes