



$$\begin{aligned} (1, 1) &= a \\ (1, 7) &= b \\ (5, 2) &= c \\ (5, 4) &= d \end{aligned}$$

03/10/2015

What is best fitting LINEAR equation
for the 4 points? LINEAR = line

$$y = mx + b$$

\swarrow slope \swarrow intercept

What would be good estimate for the slope m ?

The line would need to go above a
and below b - and go between
points c and d too, right?

What is above $(1, 1)$ and below $(1, 7)$?
The midpoint would be $(1, \frac{1+7}{2})$ or $(1, \frac{8}{2})$
or $(1, 4)$

$$\bullet \text{ Slope} = \frac{\text{vertical change}}{\text{horizontal change}} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x}$$

What is the midpoint that is exactly halfway between c and d, in between (5, 2) and (5, 4)?

$$\text{It would be } \left(5, \frac{2+4}{2}\right) = \left(5, \frac{6}{2}\right) = (5, 3)$$

So the slope of a line that best fits these 4 points a, b, c, and d would be:

Slope of line through two points

$$(1, 4) \text{ and } (5, 3)$$

midpoint of a and b

midpoint of c and d

$$\text{Slope} = m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 4}{5 - 1} = \frac{-1}{4}$$

Slope formula: slope = $\frac{y_2 - y_1}{x_2 - x_1}$

$$= -0.25$$

$$y = -0.25x + b$$

slope

intercept to be found using data fit

The slope here of -0.25 is perfect, and not just a guess or estimate that will get us close.

So the SHODOR Data Flyer program won't need to change the slope to improve the fit. It just needs to adjust the intercept, the b in $y = mx + b$.

- Slope = $\frac{\text{vertical change}}{\text{horizontal change}} = \frac{\text{output change}}{\text{input change}} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x}$
- Slope formula: slope = $\frac{y_2 - y_1}{x_2 - x_1}$

- Slope = $\frac{\text{vertical change}}{\text{horizontal change}} = \frac{\text{output change}}{\text{input change}} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x}$

- Slope formula: slope = $\frac{y_2 - y_1}{x_2 - x_1}$

- Lines with positive slope rise, or increase, from left to right.
- Lines with negative slope fall, or decrease, from left to right.
- Horizontal lines have zero slope.
- Vertical lines have undefined slope.
- The units for slope are the units on the vertical axis divided by the units on the horizontal axis.