

# Mean Absolute Deviation

"Average"

"ignore negatives"

"distance"

M. A. D

Step 1:

Find the

Mean

Step 2:

Find the

deviation

Step 3:

Find the

Mean of the  
deviation

Step 4

Analyze

or

Explain

## How

- Add all numbers
- Divide by the total amount of numbers.

## Example

The number of shoes a person has.

5, 6, 7, 10, 22

$$\bullet 5 + 6 + 7 + 10 + 22$$

$$= 50$$

$$\bullet \frac{50}{5} = 10$$

$$\text{Mean} = 10$$

## How

Find the distance between the Mean and the numbers.

- ignore the negatives

## How

• Add all the deviation numbers.

• Divide by the total amount of deviation numbers

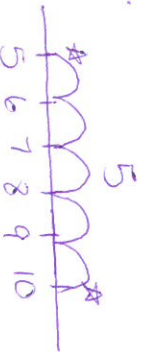
## How

- What does the Mean Absolute deviation represent?



#	mean	d
5	10	5
6	10	4
7	10	3
10	10	0
22	10	12

Ex.



5, 4, 3, 0, 12

$$\bullet 5 + 4 + 3 + 0 + 12$$

$$= 24$$

$$\bullet \frac{24}{5} = 4.8$$

$$\text{Mean} = 4.8$$



The average

distance

between the

number of shoes

a person has and

the mean of 10

is 4.8

dependent Variable  $\leftarrow$

$y = mx + b$

$\rightarrow$  independent variable

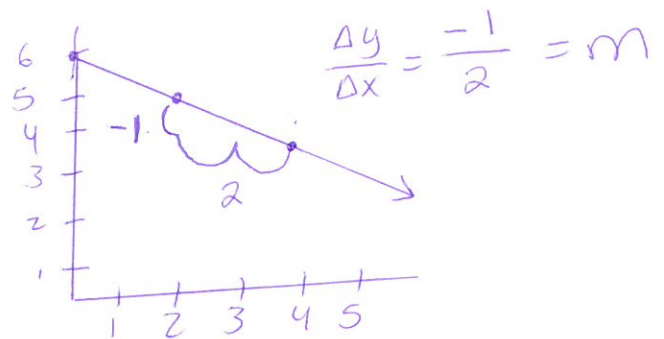
Slope

y-int

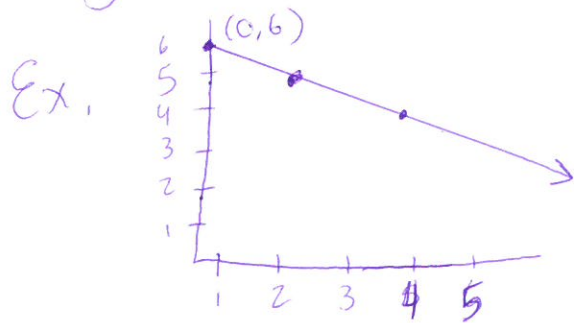
$$m = \text{Slope} = \frac{\Delta \text{rise}}{\Delta \text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

Ex.  $(5, 4)$   $(7, 3)$   
 $x_1, y_1$   $x_2, y_2$

$$\frac{3 - 4}{7 - 5} = \frac{-1}{2} = m$$



$b = y$ -intercept - where the line touches the  $y$ -axis



$$b = (0, b)$$

$$b = 6$$

$$\text{Slope} = -\frac{1}{2} \quad b = 6$$

$$y = -\frac{1}{2}x + 6$$

If  $x = 120$  what is  $y$

$$y = -\frac{1}{2}x + 6$$

$$y = -\frac{1}{2}(120) + 6$$

$$y = 66$$

If  $y = 120$  what is  $x$

$$y = -\frac{1}{2}x + 6$$

$$120 = -\frac{1}{2}x + 6$$

$$(-2)114 = -\frac{1}{2}x(-2)$$

$$-228 = x$$



Bivariate Data

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Scatterplots

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Linear

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Non-Linear

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Positive

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Negative

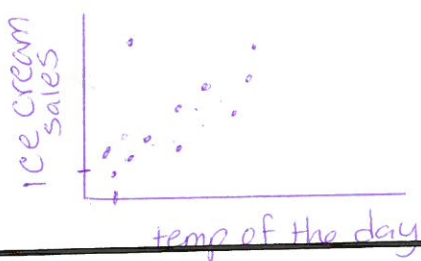
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Trend Line

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## Example

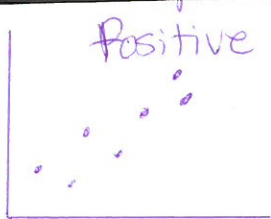
Ice cream sales  
vs  
temp. of the day



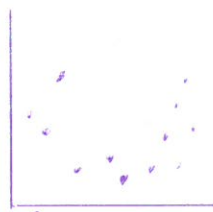
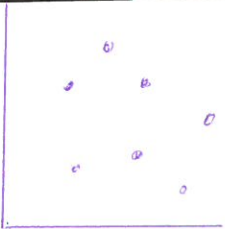
## Definition

Data for two variables  
- usually two types of related data.

A scatter (XY) Plot has points that show the relationship between 2 sets of data



- looks like a line  
- has a relationship  
- line of best fit.



- No relationship  
- could be a curve  
- doesn't have a line of best fit

temp. increase, ice cream sales increase.

temperature decreases, ice cream sales decrease.

- The data moves in the Same direction.

- Both increase or (picture above on linear)  
- Both decrease

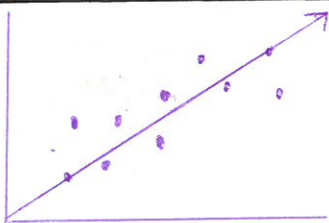
temp. inc, coat sales dec.

temp. dec, coat sales inc.

The data moves in the opposite direction.

- As one inc., the other dec.  
- As one dec., the other inc.

4 points above and below line



- Also known as the line of best fit,  $y = mx + b$   
- the line is placed close to the data points.  
- Same amount of points above and below.