

Lesson 5:

Mayer Line of Best Fit



Mar 25-5:04 PM

For any scatter plot of data, the **regression line** is the line that best fits the set of points of the scatter plot

linear

non-linear

Mar 26-9:06 AM

Equation of a Linear Regression Line from a scatter plot


- line is straight
- follows the slope of the scatter plot
- divides the data: half below line, half above line
- goes through as many points as possible

Mar 26-9:10 AM

Equation of a Linear Regression Line from a scatter plot

- use two points that are on the line
- find the rule
- use the rule to make predictions

(23, 540)



(18, 420)



Mar 26-9:10 AM

why do we have to be "careful" when we use a regression line to make predictions?

Mar 26-9:03 AM

Mayer Line of Best Fit

To determine the equation of the regression line when the data is given in a table - you don't have to make a scatter plot!

x	6	7	10	13	14	15	18	19	23	25
y	23	26	39	44	48	55	50	65	68	72

Step 1: make sure all the x-coordinates are in order - *x's and y's stay together*

Step 2: Divide the pairs into two equal groups, if possible - *if not, one will be bigger and that's okay*

Step 3: Determine the mean (average) of the x's and y's in each group - *that's 4 averages!* Call these points $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$

Step 4: Use these points to determine the equation of the regression line.

$$x_1 = \frac{(6+7+10+13+14)}{5} = \frac{50}{5} = 10 \quad \left| \quad x_2 = \frac{(15+18+19+23+25)}{5} = \frac{100}{5} = 20$$

$$y_1 = \frac{(23+26+39+44+48)}{5} = 36 \quad \left| \quad y_2 = \frac{(55+50+65+68+72)}{5} = 62$$

$(10, 36)$ $(20, 62)$
 x_1, y_1 x_2, y_2

$a = \frac{y_2 - y_1}{x_2 - x_1} = \frac{62 - 36}{20 - 10} = \frac{26}{10} = 2.6$

$y = 2.6x + b$
 $36 = 2.6(10) + b$ $36 - 26 = b$
 $10 = b$

$y = ax + b$ ✓
 $y = 2.6x + 10$ ✓

Jan 26-9:59 PM

example: The diameter of moss/lichens growing on gravestones was measured.

Mar 26-8:54 AM

example: The stopping distances of cars

Mar 25-5:18 PM

example: Depth of water (river) and velocity of the current

Mar 26-8:57 AM

example: mass of a cat and body length (tail included)

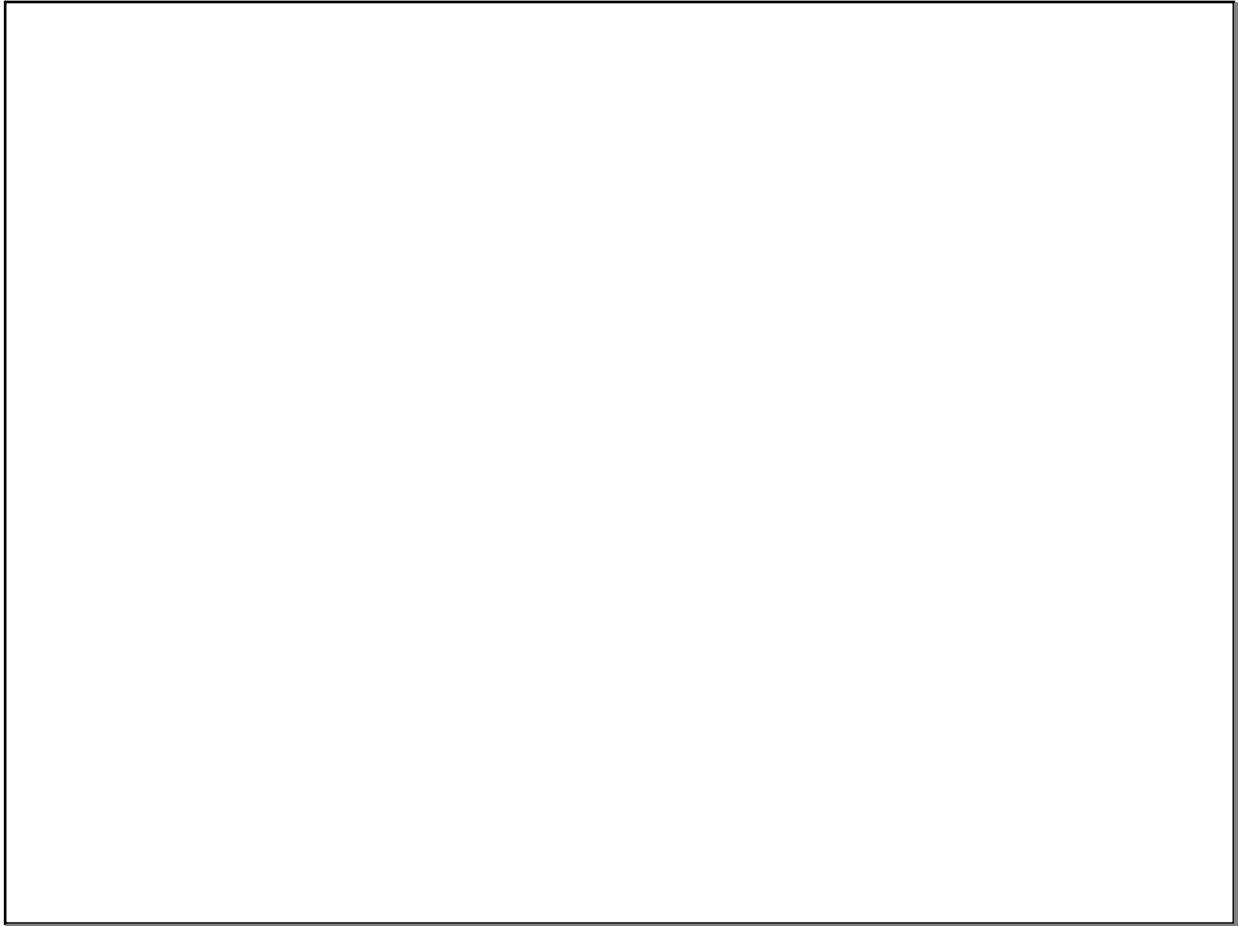
Mar 26-8:58 AM

example: days absent and grades

Mar 26-9:00 AM

example: body mass and brain mass of mammals

Mar 26-9:01 AM



Mar 26-9:05 AM