

U3D6_T Line of Best Fit

Wednesday, March 28, 2018 1:02 PM



U3D6_T
Line of Be...

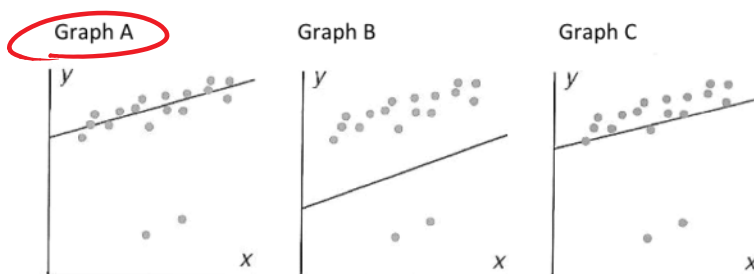
U3L6 Line of Best Fit

Line of Best Fit: is a line that approximates the “trend” of the data.

- Goes through as many points as possible
- Try to have roughly the same number of points above and below the line.

Drawing a line of best fit: Find a pathway through the middle of the data. The more spread out the data is the more difficult it is to draw the line of best fit. The line of best fit should reflect all valid points including outliers.

Example 1) Which line is the line of best fit? Justify your choice.



A line of best fit can be used to make predictions.

Interpolation: Using the line of best fit to make a prediction 'in between' the data points that are plotted.

Extrapolation: Using the line of best fit to make a prediction 'beyond' the plotted data points.

Data Spread and Reliability How confident can we be of predictions made from scatter plots?

A model with data spread over a larger interval is more reliable than data spread over a smaller interval. The farther we get from the main cluster the less confidence we can have on the predictions we make.

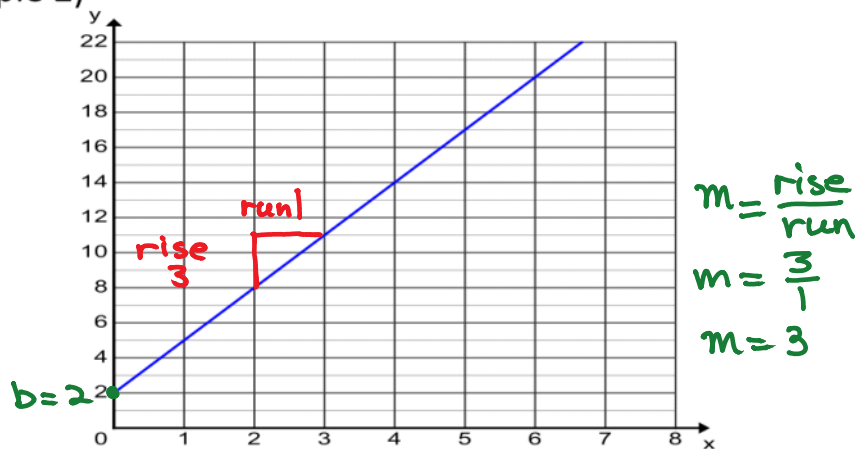
Sample Size and Reliability The more data we use, the more reliable the prediction should be.

Non Linear Data Not all relationships between variables are linear. Over a small interval a linear model may be a reasonable fit but not at extremes.

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U3D7: LINE OF BEST FIT ASSIGNMENT DONE IN CLASS (DUE AT THE END OF CLASS U3D7)

Example 2)



Find the equation of the line of best fit.

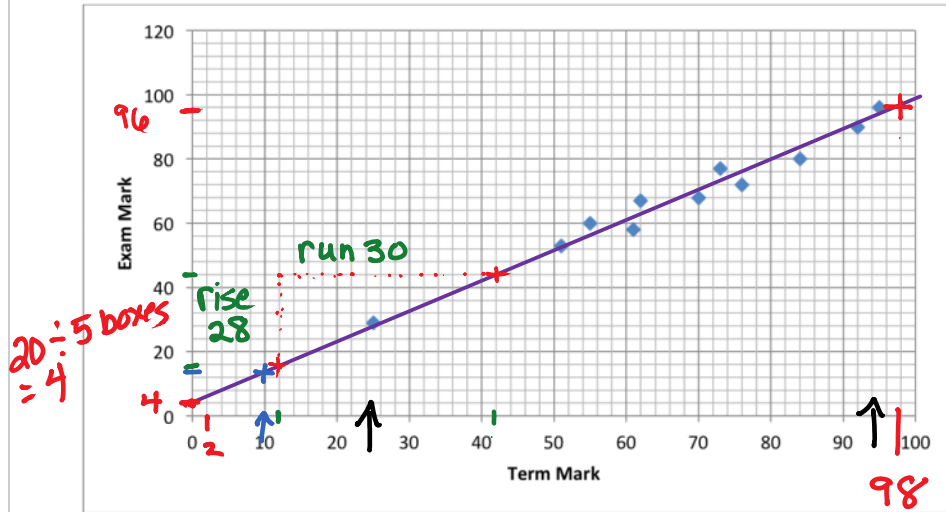
$$y = mx + b$$
$$y = 3x + 2$$

b is the y -intercept
 m is the slope

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Example 3) These are pre-exam term marks and exam marks for some students in a gr. 12 English course.



- a) Draw a line of best fit
 b) Determine an equation of the line of best fit.

$$b = 4 \quad m = \frac{\text{rise}}{\text{run}} \quad y = mx + b$$

$$m = \frac{28}{30} \quad y = \frac{14}{15}x + 4$$

$$m = \frac{14}{15}$$

- c) Use the data to predict the exam mark of a student with a term mark of 98%. Is this Interpolation or Extrapolation?

96%

- d) Use the data to predict the exam mark of a term mark of 10%. Is this Interpolation or Extrapolation?

13%

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