Engineering Virtual Learning

HS Intro to Engineering Design Lesson #14

April 23, 2020

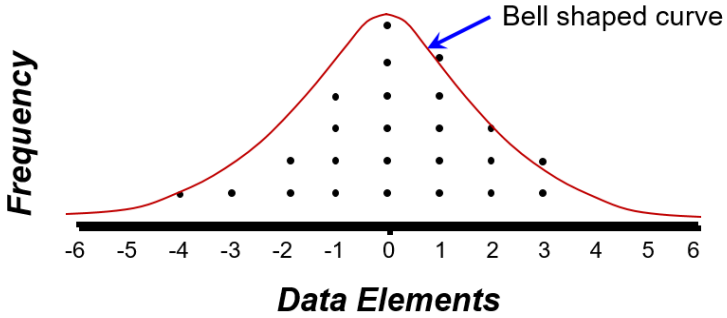
Objective/Learning Target:

Students will reflect on “Free Throw” data while working with the Empirical Rule.

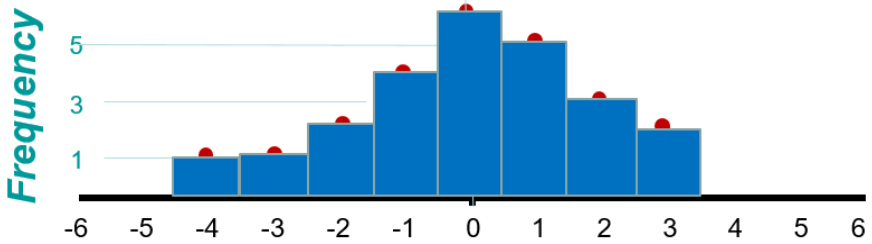
(project day 4 of 4)

Bell-work:

Do these Normal Distribution Bell Curve and the Frequency Distribution show the same data? Why or Why Not?



Bell Curve is symmetrical and the Frequency is skewed left.



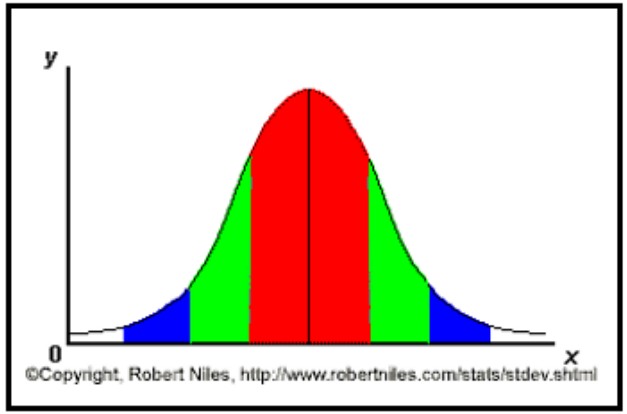
Explain why your Free Throw data would probably not be normally distributed.

Record your answers in your engineers notebook in the "Free Throw Activity and the Empirical Rule"

Learning Practice: **The Empirical Rule**

If our data has a "normal bell curve" distribution, we can use the empirical rule to predict the outcome of future data.

If the data are normally distributed:



- **68%** of the observations fall within **1 standard deviation** of the **mean**.
- **95%** of the observations fall within **2 standard deviations** of the **mean**.
- **99.7%** of the observations fall within **3 standard deviations** of the **mean**.

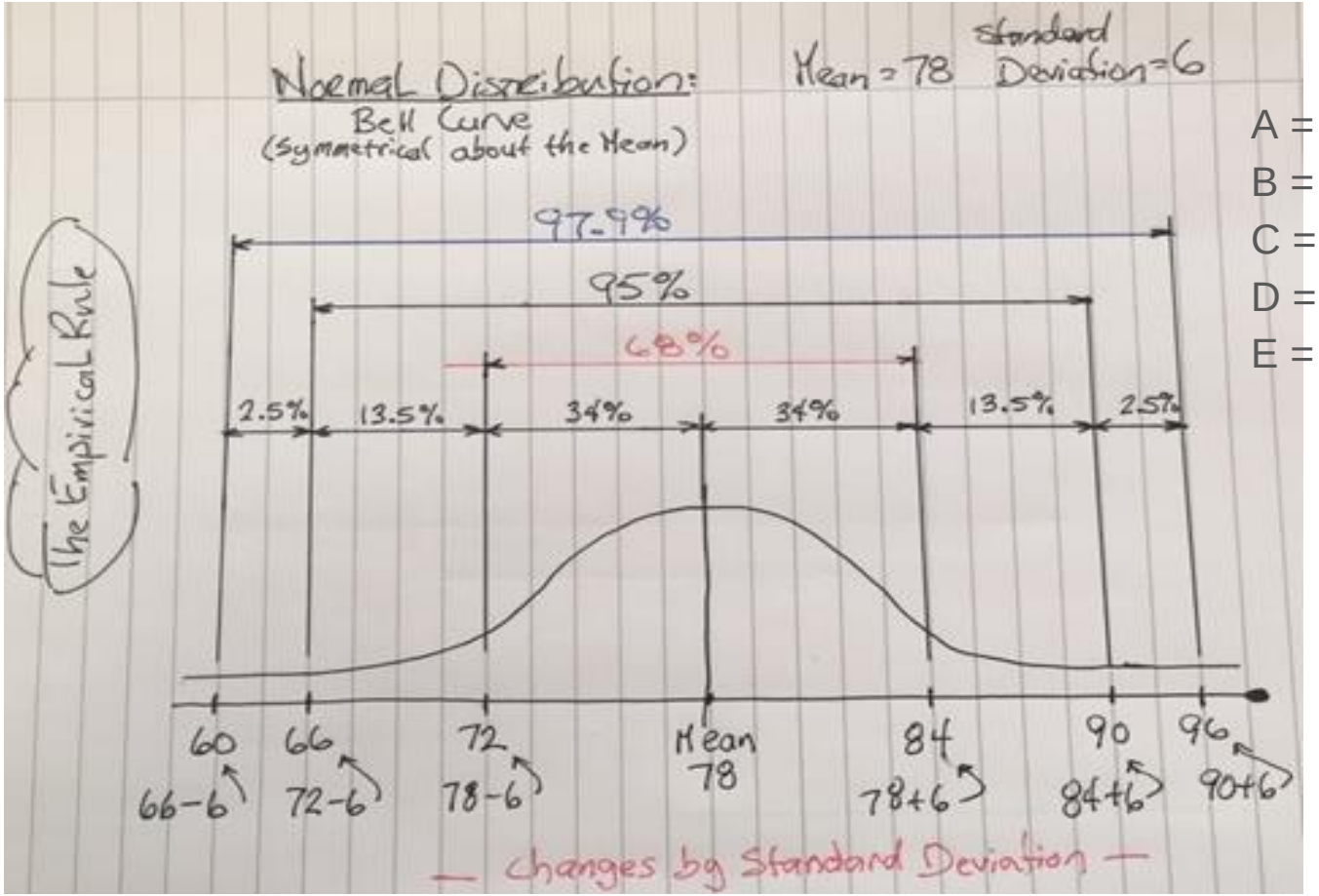
Empirical Rule Activity Problem-

A set of 1300 test scores is normally distributed. Out of 100 possible points, the mean is 78 and the standard deviation is 6.
Draw a graph using the Empirical Rule to answer the following questions.

A. How many students scores are between 72 and 84?
B. How many students scores are between 66 and 90?
C. How many students scores are between 78 and 84?
D. How many students scores are lower than 72?
E. How many students scores are lower than 84?

Show all your work in your engineers Notebook

Check for Understanding: Answer Key



A = 68%(1300) = 884 students

B = 95%(1300) =1235 students

C = 34%(1300) = 442 students

D = 16%(1300) = 208 students

E = 84%(1300) =1092 students

Learning Resource Links:

Emprical Rule –
https://www.youtube.com/watch?v=OhRr26AfFBU
https://www.youtube.com/watch?v=2fzYE-Emar0
https://www.youtube.com/watch?v=2MgYDrGcn6c

Measures of central tendancy or Statistics -
https://www.khanacademy.org/math/ap-statistics/summarizing-quantitative-data-ap/measuring-center-quantitative/v/statistics-intro-mean-median-and-mode

Standard Deviation –
https://www.youtube.com/watch?v=E4HAYd0QnRc
https://www.youtube.com/watch?v=HvDqbzu0i0E