

Get out your Unit 6 Outline and make sure your 6.7 - 6.13 HW is finished, it is all due today!

*We are skipping Unit 7 and moving into Unit 8 today.

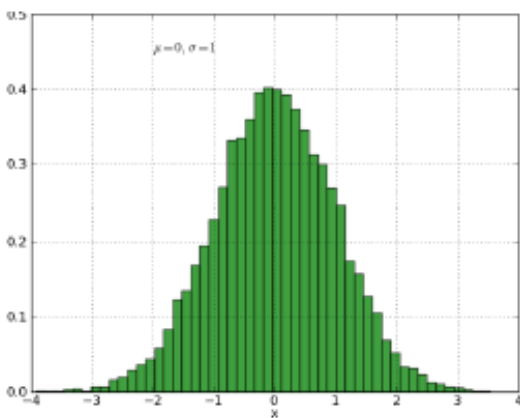
8.1 What is Normal?

A Develop Understanding Task

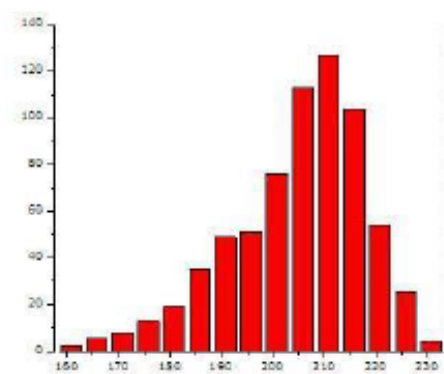
One very important type of data distribution is called a "normal distribution." In this case the word "normal". In this task, you will be given pair of data distributions represented with histograms and distribution curves. In each pair, one distribution is normal and one is not. Your job is to compare each of the distributions given and come up with a list of features for normal distributions.



1. This is normal:



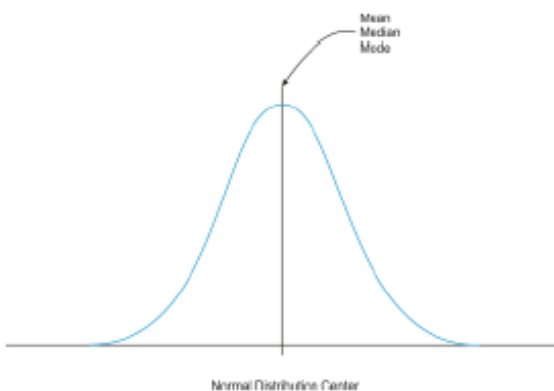
This is not:



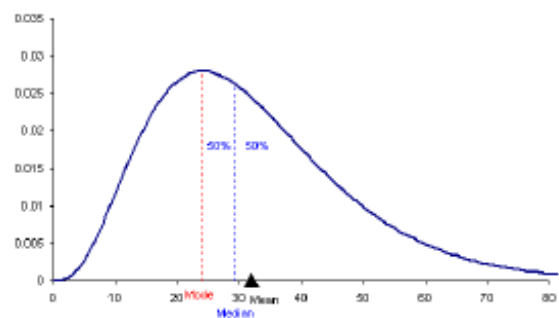
What differences do you see between these distributions?

normal curve is symmetrical about center.

2. This is normal:



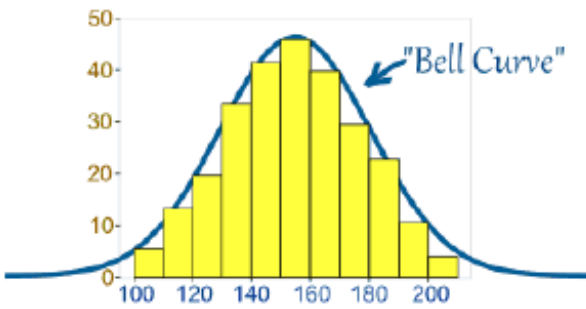
This is not:



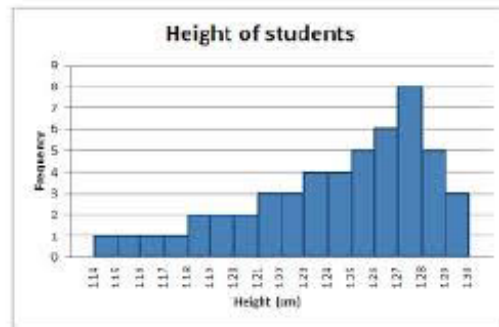
What differences do you see between these distributions?

mean, median, mode is in the center of the same # in normal curve.

3. This is normal:



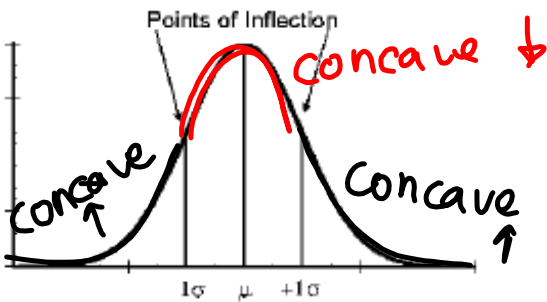
This is not:



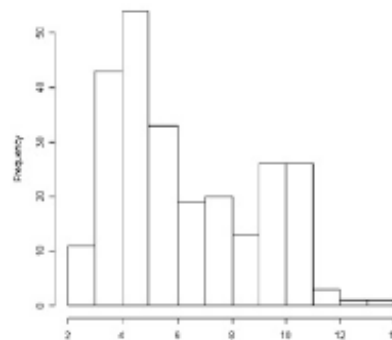
What differences do you see between these distributions?

normal curve called "bell curve" & curve is symmetrical

4. This is normal:



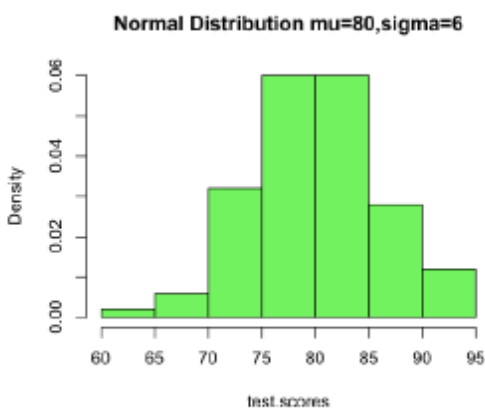
This is not:



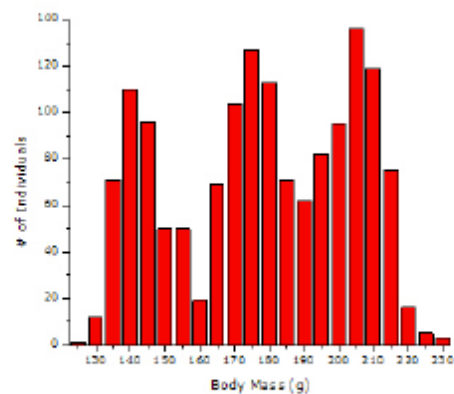
What differences do you see between these distributions?

Normal curve has pts. of inflection at ± 1 s.d. from mean.

5. This is normal:



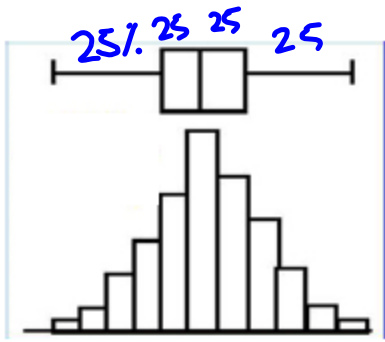
This is not:



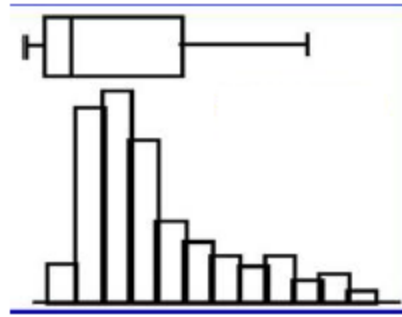
What differences do you see between these distributions?

Normal curves have one mode.

6. This is normal:



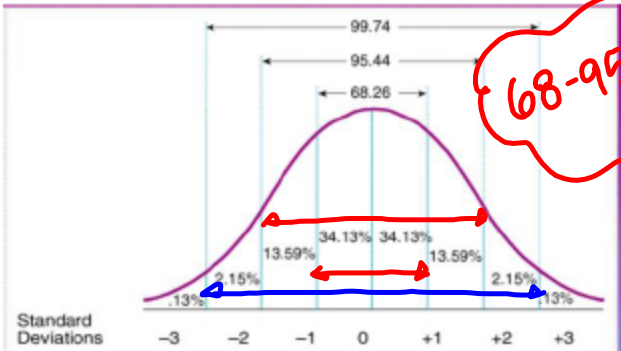
This is not:



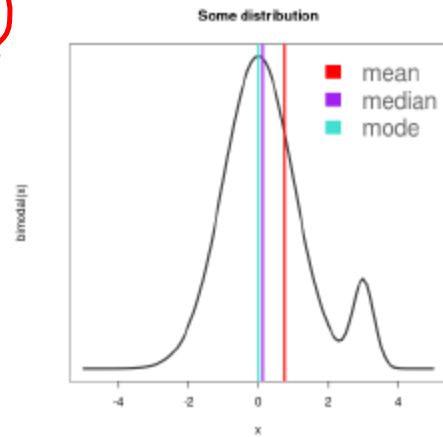
What differences do you see between these distributions?

Symmetrical box & whisker plots match up with normal curve.

7. This is normal:



This is not:



What differences do you see between these distributions?

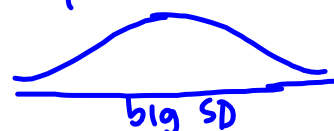
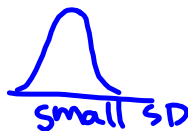
68-95-99.7 Rule for Normal Distributions

9. Based upon the examples you have seen in #1-7, what are the features of a normal distribution?

Normal distributions: are symmetric; mean, median, mode, are equal; have pts. of inflection ± 1 SD away from mean; have a single mode; 68-95-99.7 rule.

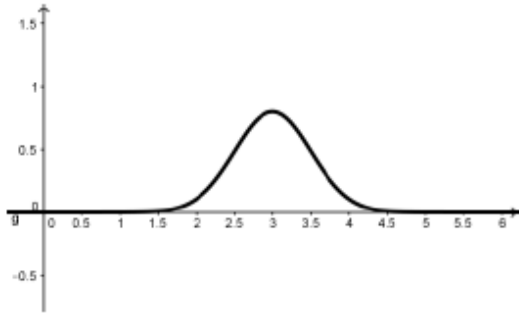
10. a. What does the standard deviation tell us about a distribution?

Standard deviation tells us how spread out our data is

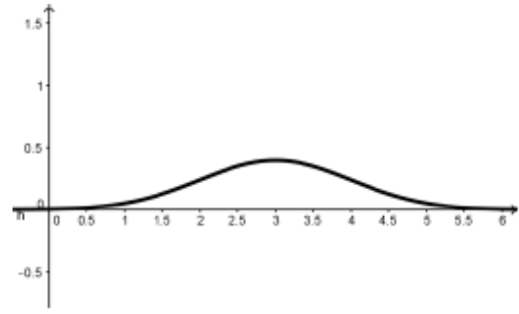


b. Each of the distributions shown below are normal distributions with the same mean but a different standard deviation.

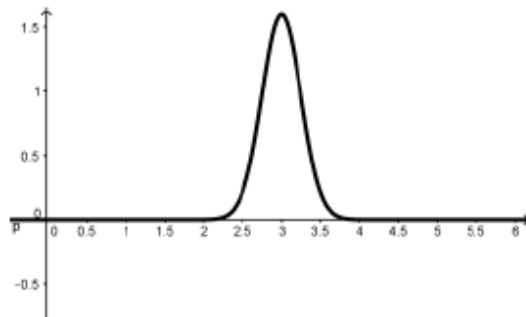
Mean = 3, Standard Deviation = 0.5



Mean = 3, Standard Deviation = 1



Mean = 3, Standard Deviation = 0.25



How does changing the standard deviation affect a normal curve? Why does it have this effect?

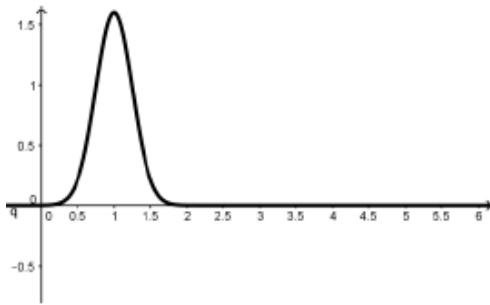
The bigger the SD is, the more spread out data is &
 the smaller the SD is, the closer together
 our data is

11. a. What does the mean tell us about a distribution?

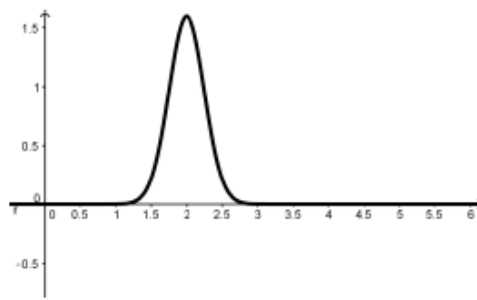
In normal dist. data, it's the tallest point; it's the middle.

b. Each of the distributions shown below are normal distributions with the same standard deviation but a different mean.

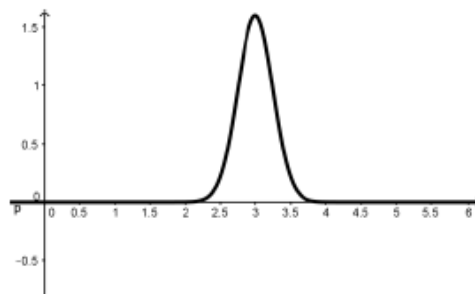
Mean = 1, Standard Deviation = 0.25



Mean = 2, Standard Deviation = 0.25



Mean = 3, Standard Deviation = 0.25



How does changing the mean affect a normal curve? Why does it have this effect?

Shifts graph along x-axis.

12. Now that you have figured out some of the features of a normal distribution, determine if the following statements are true or false. In each case, explain your answer. \bar{x} = mean

a. A normal distribution depends on the mean and the standard deviation.

True/False Why?

\bar{x} tells us where center is; SD tells us about spread.

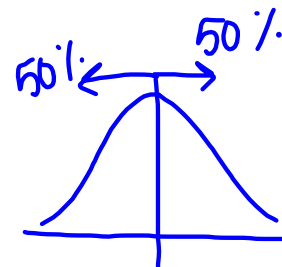
b. The mean, median, and mode are equal in a normal distribution.

True/False Why?

c. A normal distribution is bimodal.

False Why?

Has only one mode.



d. In a normal distribution, 50% of the population is within one standard deviation of the mean.

False Why?

It's 68% of data.

Homework

Finish 8.1 "Ready, Set, Go"