Progress Check Follow Up – Normal Distributions Name _____

A standard normal distribution curve for IQ scores is shown below. The mean IQ score is 100 and the standard deviation is 15.

1) In the blanks provided on the graph above, label each standard deviation unit with its corresponding IQ score.

See graph above for correct labels.

2) What percent of people have an IQ less than 100?

50% *of people have an IQ less than 100. I know this because a standard normal distribution curve is symmetrical and the mean is in the middle. Therefore, half of the data is on either side of the mean and half would equal 50%.*

3) What percent of people have an IQ greater than 85?

84% *of people have an IQ greater than 85. Using the Empirical Rule, I know that 68% of the data falls within one standard deviation of the mean (between 85 and 115 on this graph). Dividing the 68% in half will give the percentage of data one standard deviation below the mean (which is between 85 and 100), and 68/2 = 34, so 34% of the data falls between 85 and 100. We also know that 50% of the data falls above the mean of 100, and so the total percentage of data above the IQ value of 85 would be 34%+50%=84%.*

4) What percent of people have an IQ between 70 and 115?

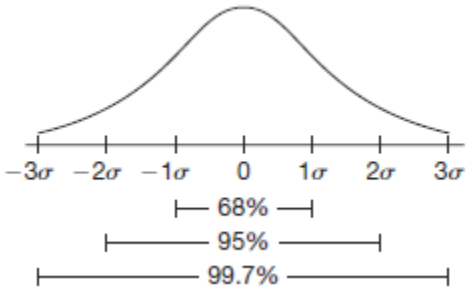
81.5% *of people have an IQ between 70 and 115. Using the Empirical Rule, I know that 95% of the data falls within two standard deviations of the mean (between 70 and 130 on this graph). We also know from the Empirical Rule that 68% of the data falls within one standard deviation of the mean (between 85 and 115). We can subtract the 68% from the 95% to figure out the percentage of data left between one and two standard deviations above and below the mean (between 70 and 85 and between 115 and 130): 95%-68%=27%. We can divide this 27% in half to get the percent in each of those two sections on either side of the 68%: 27/2=13.5. So, now we know that 13.5% of the data is between 70 and 85 and 13.5% of the data is between 115 and 130. We can subtract off the upper 13.5% of the data from the original 95% total to find the remaining percentage between 70 and 115: 95%-13.5%=81.5%.*

5) Shade the region that represents the data within one standard deviation of the mean.

The phrasing "within one standard deviation of the mean" means that we need to include the area of the curve that is one standard deviation unit above and below the mean in our shading. See graph above for correct shading.

ADDITIONAL PRACTICE ON THE BACK→

REMINDER: The Empirical Rule for Normal Distributions states:

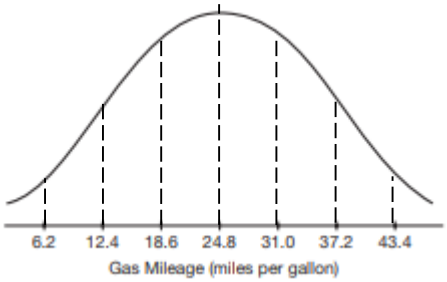


Use what you've learned about normal distributions and the Empirical Rule above to answer the questions below.

1) Identify the mean and the standard deviation for the graph to the right:

mean = _____

standard deviation = _____



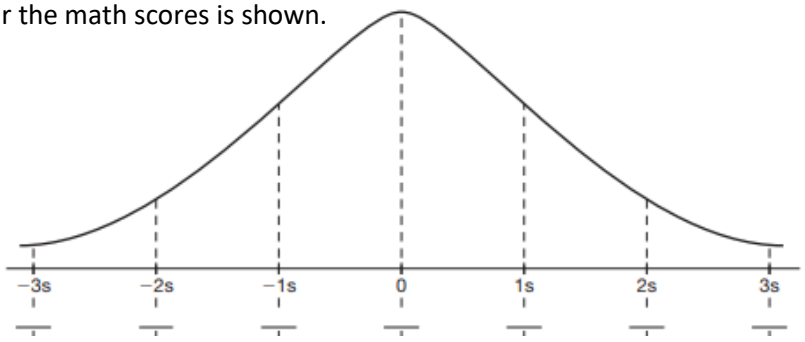
2) In the graph from the previous problem,

(a) lightly shade the area within two standard deviations of the mean

(b) put dots inside the area that is one standard deviation above the mean

(c) make stars inside the area that is between two and three standard deviations below the mean

3) On a standardized test, the mean score on the math section is 490 and the standard deviation is 100. The standard normal distribution curve for the math scores is shown.



(a) In the blanks provided on the graph above, label each standard deviation unit with its corresponding IQ score.

(b) What percentage of scores are between 390 and 690? Show your work or explain how you know.

(c) What percentage of scores are less than 690? Show your work or explain how you know.

(d) What percentage of scores are between 290 and 490? Show your work or explain how you know.