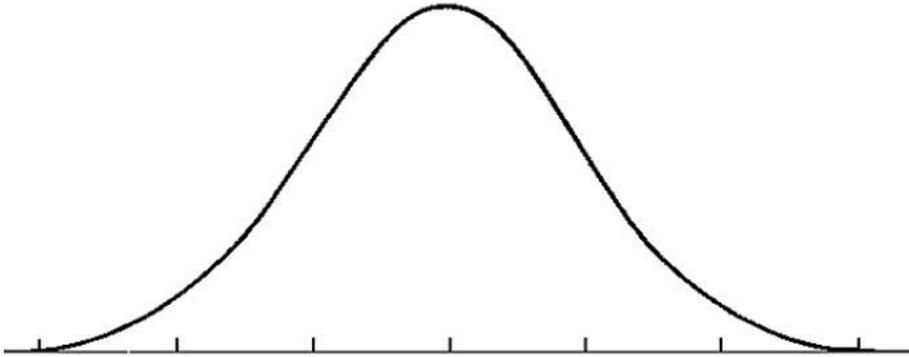


Statistics
Normal Model BIG Practice

Part I: Using 68 – 95 – 99.7% Rule

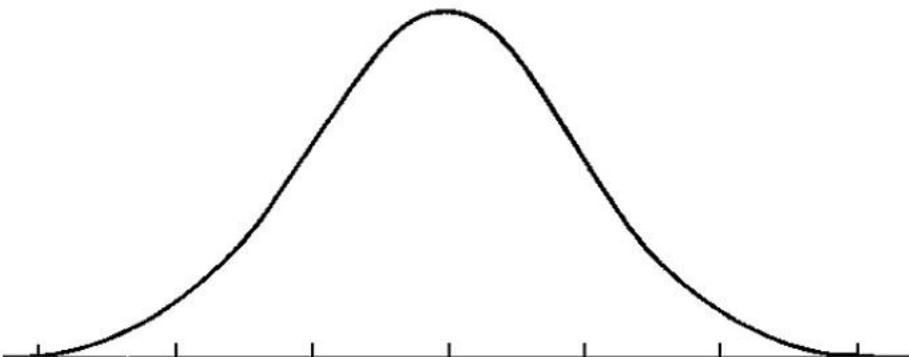
2000 freshmen at State University took a biology test. The scores were distributed normally with a mean of 70 and a standard deviation of 5. Label the mean and three standard deviations from the mean.



- a) What percentage of scores are between scores 65 and 75?
- b) What percentage of scores are between scores 60 and 70?
- c) What percentage of scores are between scores 60 and 85?
- d) What percentage of scores is less than a score of 55?
- e) What percentage of scores is greater than a score of 80?
- f) Approximately how many biology students scored between 60 and 70?
- g) Approximately how many biology students scored between 55 and 60?

Part 2: Standard Normal Model $N(0, 1)$

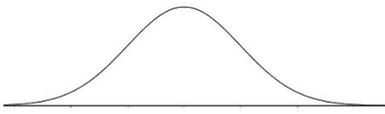
Draw and label the Standard Normal Curve.



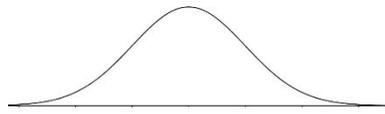
Part 3: Finding Percentiles on the Standard Normal Model

To find each percentile, draw and shade each normal model based on the z-score.

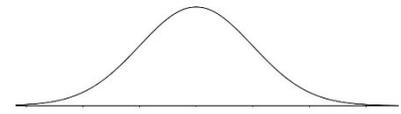
1. $(z \geq 1.5)$



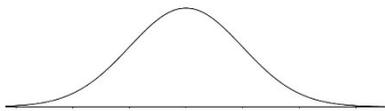
2. $(z < -0.75)$



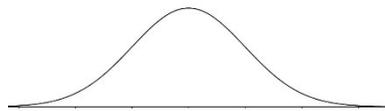
3. $(-2 < z < .5)$



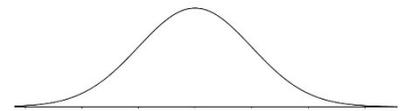
4. $(z \leq 2.3)$



5. $(-2.24 < z < -1)$



6. $(z \geq -2.3)$



Part 4: Finding Percentiles without Z-scores

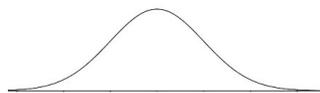
Step 1: Draw a curve and draw the line where the value is located

Step 2: Shade the region the question is asking for

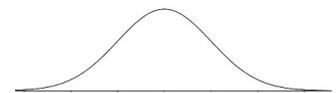
Step 3: 2nd VARS – normalcdf (lower, upper, mean, standard deviation)

Scores on the Wechsler Adult Intelligence Scale, a standard IQ test, are approximately normal for the 20 to 34 age group with $\mu = 110$ and $\sigma = 25$.

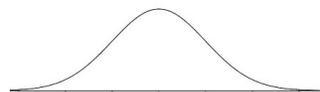
1. What percent of this age group have an IQ less than 100?



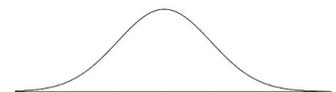
3. What percent of this age group have an IQ below 85?



2. What percent of this age group have an IQ above 120?

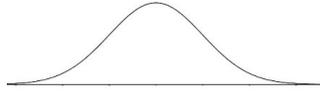


4. What percent of this age group have an IQ between 90 and 115?

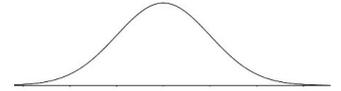


The adult men of the Dinaric Alps have the highest average height of all regions. The distribution of height is approximately normal with a mean height of 6 ft 1 in (73 inches) and standard deviation of 3 inches.

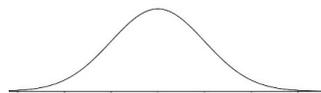
5. What percent of Dinaric Alps men have a height of above 78 inches?



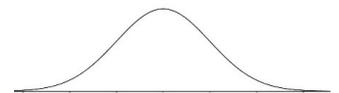
7. What percent of Dinaric Alps men have a height taller than the average American male (61 inches)?



6. What percent of Dinaric Alps men have a height less than 65 inches?



8. What percent of Dinaric Alps men have a height between 64 inches and 70 inches?



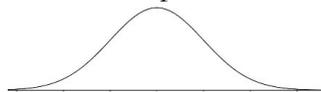
Part 4: Finding Values for Given Percentiles

Step 1: Draw the curve and shade the percent area (shade to left)

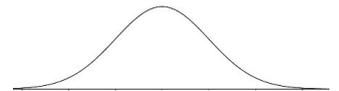
Step 2: 2nd VARS – invnorm (percent, mean, standard deviation)

Scores on the Wechsler Adult Intelligence Scale, a standard IQ test, are approximately normal for the 20 to 34 age group with $\mu = 110$ and $\sigma = 25$.

1. What IQ score represents the 90th percentile?



3. What IQ score represents the 3rd quartile



2. What IQ score represents the 25th percentile?

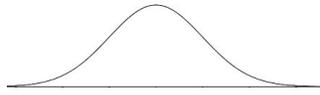


4. What is the IQR for the IQ score.

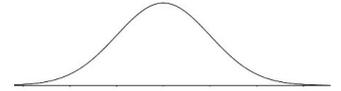


The adult men of the Dinaric Alps have the highest average height of all regions. The distribution of height is approximately normal with a mean height of 6 ft 1 in (73 inches) and standard deviation of 3 inches.

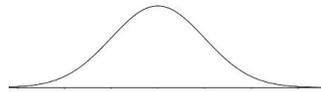
5. What height is the top 5%?



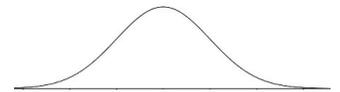
7. What height is the bottom 20%?



6. What height is the 80th percentile?



8. What is the IQR for the Dinaric Alp male heights?



Part 5: Finding Curve when given data

Here are the scores for a recent test in M414 Statistics.

90 90 95 100 80 80 75 80 70 60 95 100 100
 100 75 80 90 90 90 70 70 80 85 90 90 85

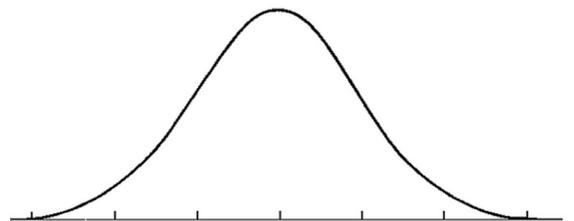
Answer the following questions regarding this set of data.

Median = _____ Mean = _____ Standard Deviation = _____

Draw and clearly label the normal model

How many scores are within 1 standard deviation of the mean?

How many scores are within 2 standard deviations of the mean?



Why does the drawing above show tests percent between 52 and 118 when the highest test grades is 100 and the lowest is 60?