In a normal distribution, what percent of the values lie:

1. below the mean? _____

2. above the mean? _____

3. within one standard deviation of the mean (-1 std. dev. $< x < +1$ std. dev.) ? __

4. within two standard deviations of the mean? _____

5. within three standard deviations of the mean? _____

6. **2000 freshmen at Utah State University took a biology test. The scores were distributed normally with a mean of 70 and a standard deviation of 5. Label the scale using the data (instead of -3, -2, -1, 0, 1, 2, 3) tic marks from the mean.**
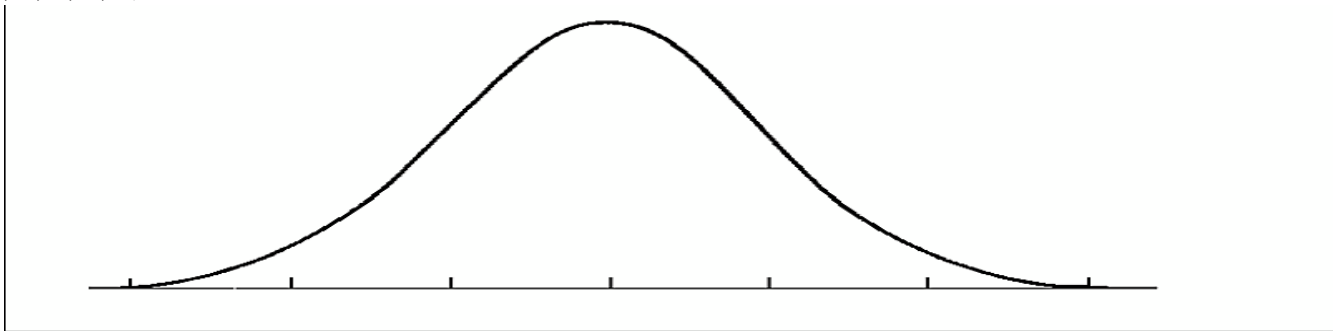
Answer the following questions based on the data:

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?

7. **500 juniors at Davis High School took the ACT last year. The scores were distributed normally with a mean of 24 and a standard deviation of 4. Label the horizontal scale using the scores vice # of std. dev. From the mean.**
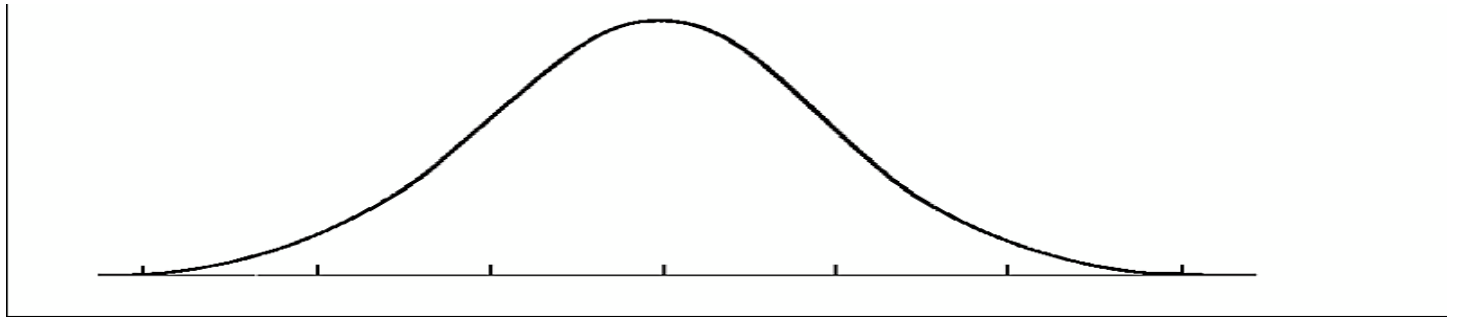
Answer the following questions based on the data:
a) What percentage of scores are between scores 20 and 28?

b) What percentage of scores are between scores 16 and 32?

c) What percentage of scores are between scores 16 and 28?

d) What percentage of scores is less than a score of 12?

e) What percentage of scores is greater than a score of 24?

f) Approximately how many juniors scored between 24 and 28?

g) Approximately how many juniors scored between 20 and 28?

h) Approximately how many juniors scored between 24 and 32?

i) Approximately how many juniors scored between 16 and 20?

j) Approximately how many juniors scored higher than 32?

9. **Use your calculator to:**
   a. Calculate the standard deviation for the following data set: {4, 5, 6, 7, 8}

   b. Calculate the standard deviation for the following data set: {2, 4, 6, 8, 10}

   c. Calculate the standard deviation for the following data set: {0, 3, 6, 9, 12}

Use the following data set: 107, 107, 107, 107, (four 107's), 93,93, 93, 93, 93, 93, 93, 93, (eight 93's), 79, 64, 57, 57, 57, 57, 57, (five 57's) for questions 10, 11, 12, 13, and 14

10. What is the range of the data?

11. What is the median of the data?

12. What is the mode of the data?

13. What are Q1 and Q3 for the data?

14. Build a "box and whisker plot <u>below</u> your frequency distribution graph that uses the same linear scale. Remember a box and whisker plot is divided into ¼'s. Each portion is ¼ of the total data. The dividing point for the low two quartiles is the "median of the lower have of the data". Same for the upper ½ of the data. The middle number is the median of all of the data.

50   55   60   65   70   75   80   85   90   95   100   105   110
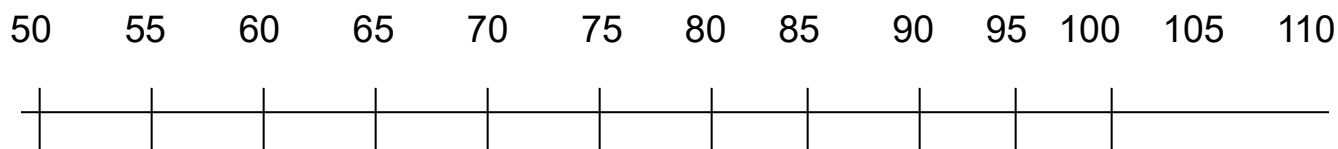
15. Using the scale below and the four data sets (A, B, C, and D) which data set has:
   a. The widest spread?
   b. The largest inter-quartile range?
   c. a likely "outlier"?
   d. a bell-shaped distribution?

10   20   30   40   50   60   70   80   90   100   105

A

B

C

D