Name _____ Per: _____ Date _____
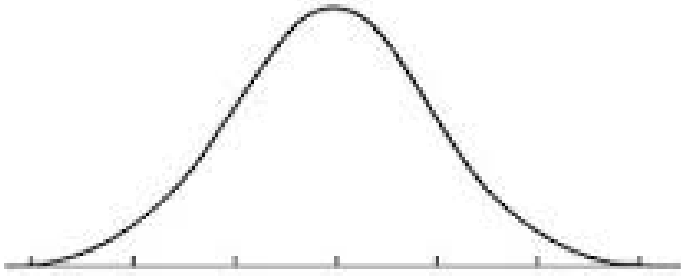
Normal Distributions Worksheet (12-7)

A set of data with a mean of 45 and a standard deviation of 8.3 is normally distributed. Find each value, given its distance from the mean.
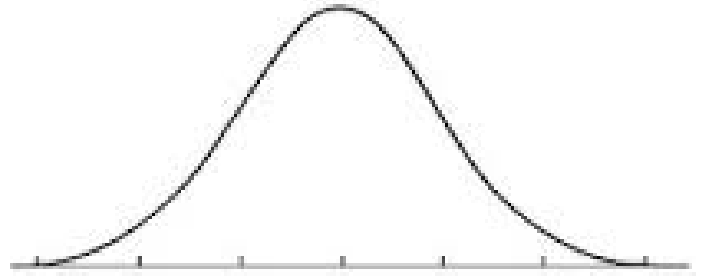
1. +1 standard deviation from the mean

2. +3 standard deviations from the mean

3. –1 standard deviation from the mean

4. –2 standard deviations from the mean

Sketch a normal curve for each distribution. Label the *x*-axis at one, two, and three standard deviations from the mean.
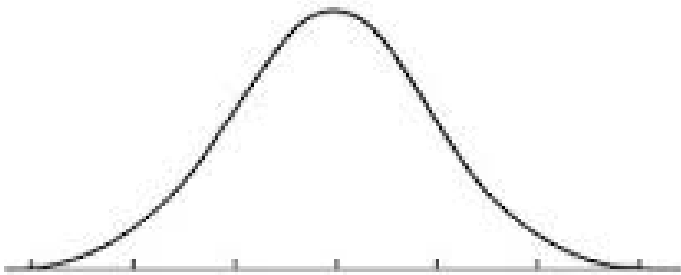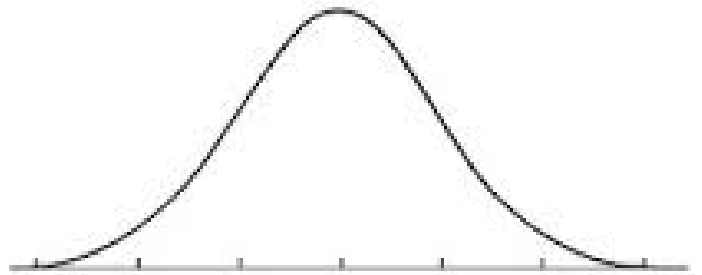
5. mean = 95; standard deviation = 12
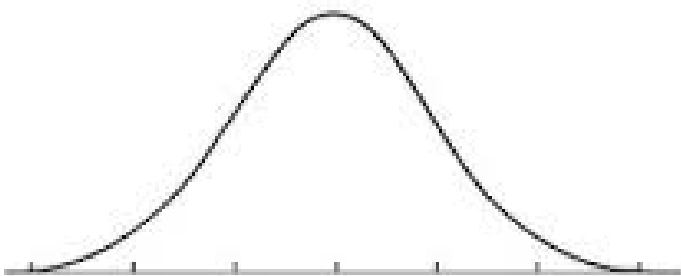
6. mean = 100; standard deviation = 15

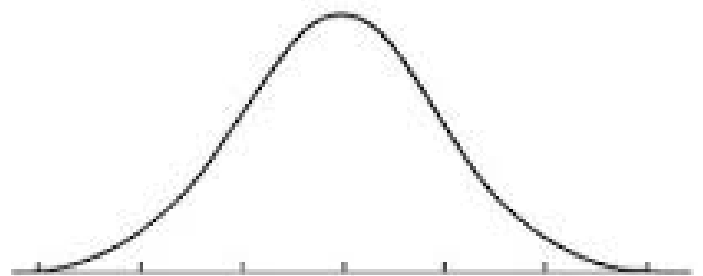7. mean = 60; standard deviation = 6

8. mean = 23.8; standard deviation = 5.2

9. mean = 676; standard deviation = 60

10. mean = 54.2; standard deviation = 12.3

A set of data has a normal distribution with a mean of 5.1 and a standard deviation of 0.9. Find the percent of data within each interval.

11. Sketch a normal curve for the distribution.
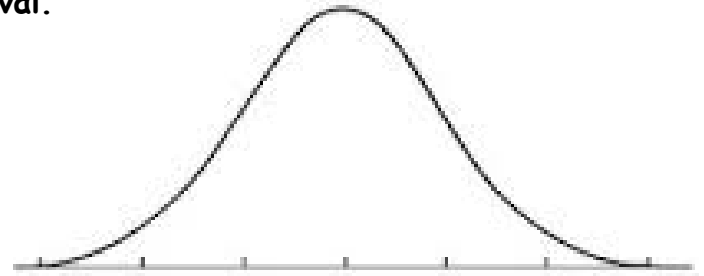
12. between 6.0 and 6.9

13. greater than 6.9

14 between 4.2 and 6.0

15. less than 4.2   16. less than 5.1   17. between 4.2 and 5.1

18. Test scores are normally distributed with a mean of 76 and a standard deviation of 10.
   a. In a group of 230 tests, how many students score above 96?

   b. In a group of 230 tests, how many students score below 66?

   c. In a group of 230 tests, how many students score within one standard deviation of the mean?

19. The number of nails of a given length is normally distributed with a mean length of 5.00 in. and a standard deviation of 0.03 in.
   a. Find the number of nails in a bag of 120 that are less than 4.94 in. long.

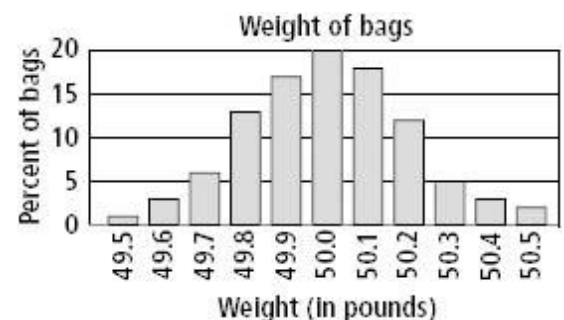   b. Find the number of nails in a bag of 120 that are between 4.97 and 5.03 in. long.

   c. Find the number of nails in a bag of 120 that are over 5.03 in. long.

20. The actual weights of bags of pet food are normally distributed. The mean of the weights is 50.0 lb, with a standard deviation of 0.2 lb. Use the graph for a – c.
   a. About what percent of bags of pet food weigh less than 49.8 lb?
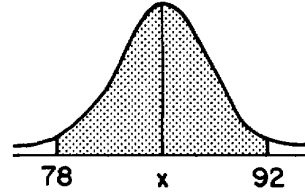
   b. In a group of 250 bags, how many would you expect to weigh more than 50.4 lb?

   c. In a group of 50 bags, how many would you expect to be within 1.5 standard deviations of the mean?
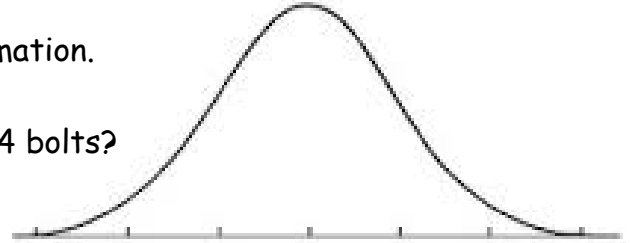
21. In the accompanying diagram, the shaded area represents approximately 95% of the scores on a standardized test. If these scores ranged from 78 to 92,

a) What is the mean?

b) What is the standard deviation?

78   x   92

22. A machine is used to put bolts into boxes. It does so such that the actual number of bolts in a box is normally distributed with a mean of 106 and a standard deviation of 2.
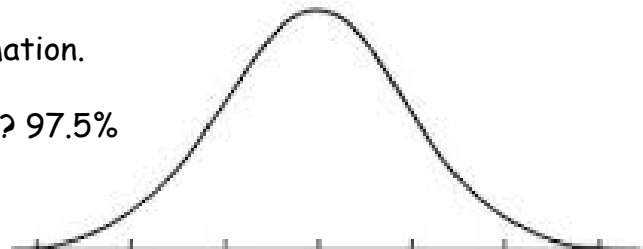
a) Draw and label the Normal curve from the information.

b) What percentage of boxes contain more than 104 bolts?

c) What percentage of boxes contain more than 110 bolts?

d) What percentage of boxes contain less than 108 bolts?

e) What percentage of boxes contain less than 100 bolts?

f) What percentage of boxes contain between 102 and 112 bolts?

g) What percentage of boxes contain between 100 and 106 bolts?

23. The heights of the people if the planet Ixx are normally distributed with a mean of 40 inches and a standard deviation of 5 inches. [They are a vertically diverse people.]

a) Draw and label the Normal curve from the information.

b) 97.5% of Ixxians are over _____ inches tall? 97.5%

c) 16% of Ixxians are over _____ inches tall?

d) 50% of Ixxians are under _____ inches tall?

e) 97.5% of Ixxians are under _____ inches tall?

f) the most "average" 68% of Ixxians are between _____ and _____ inches tall?

g) 84% of Ixxians are over _____ inches tall?

24. On a standardized test, Phyllis scored 84, exactly one standard deviation above the mean. If the standard deviation for the test is 6, what is the mean score for the test?

25. The heights of a group of girls are normally distributed with a mean of 66 inches. If 95% of the heights of these girls are between 63 and 69 inches, what is the standard deviation for this group?

26. A set of scores with a normal distribution has a mean of 50 and a standard deviation of 7. Approximately what percent of the scores fall in the range 36-64?

27. On a standardized test with a normal distribution, the mean was 64.3 and the standard deviation was 5.4. What is the best approximation of the percent of scores that fell between 61.6 and 75.1?

28. The mean of a normally distributed set of data is 52 and the standard deviation is 4. Approximately 95% of all the cases will lie between which measures?

29. Battery lifetime is normally distributed for large samples. The mean lifetime is 500 days and the standard deviation is 61 days. Approximately what percent of batteries have lifetimes *longer than* 561 days?

30. A test was given to 120 students, and the scores approximated a normal distribution. If the mean score was 72 with a standard deviation of 7, approximately what percent of the scores were 65 or higher?