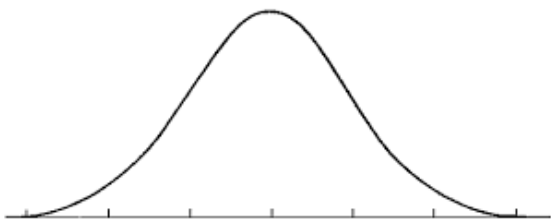AA9-3 Assignment   Name_____Period_____
Z-scores and the Normal Model

1. If a person has a negative z-score, did the person score higher or lower than the mean? _____

2. If a person has a negative z-score, it does not always mean that the person did not do well. Name a sport where having the lowest z-score would be the most desirable. _____

For #3 – 9: The mean weight of adult American men is 180 pounds with standard deviation of 25 pounds. The weights are approximately normally distributed. Use the 68%-95%-99.7% Rule to approximate each of the following.

3. Using the values given above, label the normal curve at the right with the numerical values and percentages.
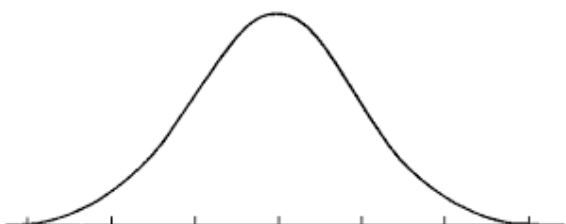

4. What percent of all adult American men have a weight less than 130 pounds? _____

5. What percent of all adult American men have a weight between 130 and 205 pounds? _____

6. What percent of all adult American men have a weight less than 230 pounds? _____

7. What percent of all adult American men have a weight less than 105 pounds? _____

8. The heaviest 16% of all men in weight weigh more than how many pounds? _____

9.   a. What is the z-score for a man who weighs 215 pounds?

         b. What would you estimate his percentile to be? Explain.

         c. Use the z-table or calculator to get a more precise estimation of his percentile.

For #10 –17: Elephants have the longest pregnancy of all mammals. One species of elephant has a mean gestation period of 525 days and standard deviation of 32 days. Pregnancy length follows an approximately normally distribution. Use the 68%-95%-99.7% Rule to approximate each of the following.
10. Label the model below, then answer the questions on the back side.

11. The longest 16% of all elephant pregnancies last at least how many days?_____

12. The middle 68% of all elephant pregnancies last between _____ and _____ days.

13. Only 2.5% of all elephant pregnancies last longer than _____ days.

14. What percent of elephant pregnancies last less than 461 days? _____

15. What percent of elephant pregnancies last between 525 and 557 days? _____

18. Maria made 75% on her Government test and 83% on her Algebra 2 test. The mean grade on the Government test was 72% with a standard deviation of 5%. The average grade on the Algebra 2 test was 81% with a standard deviation of 4%. On which test did Maria do better? Use z-scores to compare.

19. For a standard normal distribution, the mean μ is always _____ and the standard deviation σ is always _____ _____. Complete the standardized model below.

For #20 – 25: Use the calculator to find the proportion of observations that satisfies each of the following statements. In each case, shade the area under the curve that is the answer to the question.

20.

-3 -2 -1 0 1 2 3

z is less than –1.83

21.

-3 -2 -1 0 1 2 3

z is greater than 2.18

22.

-3 -2 -1 0 1 2 3

z is less than 0.33

23.

-3 -2 -1 0 1 2 3

z is between 1.42 and 2.68

24.

-3 -2 -1 0 1 2 3

z is greater than –0.51

25.

-3 -2 -1 0 1 2 3

z is between –2 and 1.53