Normal Distribution Practice/Review Name:_____ A# _____

1. Consumer Reports Magazine wrote an article stating that monthly charges for cell phone plans in the U.S. are normally distributed with a mean of $62 and a standard deviation of $18.

a) Draw a picture of the normal curve with the cell phone charges for 1, 2 and 3 standard deviations above and below the mean.

b) What percent of people in the U.S. have a cell phone bill between $62 and $80 per month? How do you know?

c) Between what two cell phone charges are the middle 95% of people? How do you know?

d) What percent of people in the U.S. have a monthly cell phone bill between $26 and $44? How do you know?

2. A survey was conducted to measure the height of U.S. men. In the survey, respondents were grouped by age. In the 20–29 age group, the heights were normally distributed, with a mean of 69.2 inches and a standard deviation of 2.9 inches. A study participant is randomly selected. *(Source: U.S. National Center for Health Statistics)*

a) Find the percentile for a height of 66 inches. What does this tell us about how tall this person is compared to other men?

b) Find the percent of heights between 66 and 72 inches. How do you know?

c) Find the percent of heights that are greater than 72 inches. How do you know?

d) Find the height of a man who is taller than or as tall as 20% of adult men. How do you know?

3. The lengths of Atlantic croaker fish are normally distributed, with a mean of 10 inches and a standard deviation of 2 inches. An Atlantic croaker fish is randomly selected. *(Adapted from National Marine Fisheries Service, Fisheries Statistics and Economics Division)*

a) Find the percentage that the length of the fish is less than 7 inches. How do you know?

b) Find the percentage that the length of the fish is between 7 and 15 inches. How do you know?

c) Find the percentage that the length of the fish is more than 15 inches. How do you know?

d) If 200 Atlantic croakers are randomly selected, about how many would you expect to be shorter than 8 inches? How do you know?

4. In a recent year, the ACT scores for high school students with a 3.50 to 4.00 grade point average were normally distributed, with a mean of 24.1 and a standard deviation of 4.3. *(Source: ACT, Inc.)*

a) Find the percentile of a student whose ACT score is a 20. What does this tell you about how well the student did compared to others?

b) Find the percent of scores between 22 and 27.

c) If a student is in the 14^{th} percentile what score did they receive on the ACT?

d) If a student's score is in the 83^{rd} percentile what score did they receive on the ACT?

5. The weights of adult male rhesus monkeys are normally distributed, with a mean of 15 pounds and a standard deviation of 3 pounds. A rhesus monkey is randomly selected.

a) If a monkey weighs 13 pounds, how many standard deviations below the mean was this?

b) George the monkey weighs 19 pounds. Find the standardized value for 19 pounds. What does this tell us about George's weight?