Statistics Name _____

A2RCC U11D3 Homework Normal Distribution and ZScores

1) At Arlington High School, 424 juniors recently took the SAT exam. On the math portion of the exam, the mean score was 540 with a standard deviation of 80. If the scores on the exam were normally distributed, answer the following questions.

(a) What percent of the math scores fell between 500 and 660?

(b) How many scores fell between 500 and 660? Round your answer to the nearest whole number.

(c) If Evin scored a 740 on her math exam, what percent of the students who took the exam did better than her?

(d) Approximately how many students did better than Evin?

2) ***Exercise* #3:** The heights of 16 year old teenage boys are normally distributed with a mean of 66 inches and a standard deviation of 3. If Jabari is 72 inches tall, which of the following is closest to his height's percentile rank?

(1) 85^{th} (3) 98^{th}

(2) 67^{th} (4) 93^{rd}

3) ***Exercise* #4:** The amount of soda in a standard can is normally distributed with a mean of 12 ounces and a standard deviation of 0.6 ounces. If 250 soda cans were pulled by a company to check volume, how many would be expected to have less than 11.1 ounces in them?

(1) 17 (3) 28

(2) 23 (4) 11

4) ***Exercise* #1:** Boy's heights in seventh grade are normally distributed with a mean height of 62 inches and a standard deviation of 3.2 inches. Find z-scores, rounded to the nearest hundredth, for each of the following heights. Show the calculation that leads to your answer.

(a) $x_i = 66$ inches (b) $x_i = 57$ inches (c) $x_i = 70$ inches

5) ***Exercise #2:*** Jeremiah took a standardized test where the mean score was a 560 and the standard deviation was 45. If Jeremiah's score resulted in a z-value of 1.84, then what was Jeremiah's score to the nearest whole number?

6) ***Exercise #3:*** The lengths of full grown sockeye salmon are normally distributed with a mean of 29.2 inches and a standard deviation of 2.4 inches.

(a) Find z-scores for sockeye salmon whose lengths are 25 inches to 32 inches. Round to the nearest hundredth.

(b) Use the z-score table to determine the proportion of the sockeye salmon population, to the nearest percent, that lies between 25 inches and 32 inches. Illustrate your work graphically.

7) ***Exercise #4:*** If the scores on a standardized test are normally distributed with a mean of 560 and a standard deviation of 75. Answer the following questions by using z-scores and the normal distribution table.

(a) Find the probability that a test picked at random would have a score larger than 720. Round to the nearest tenth of a percent.

(b) Find the probability that a completed test picked at random would have a score less than 500. Round to the nearest tenth of a percent.

(c) Find the probability that a completed test picked at random would have a score between 500 and 600.

(d) Find the probability that a completed test picked at random would have a score between 600 and 700.

8) ***Exercise #5:*** The average weight of full grown beef cows is 1470 pounds with a standard deviation of 230 pounds. If the weights are normally distributed, what is the percentile rank of a cow that weighs 1,750 pounds?

(1) 89^{th}

(2) 76^{th}

(3) 49^{th}

(4) 35^{th}