ENGR/PHYS 216 – Spring 2023
HW Assignment 4: Basic Experimental Statistics

Note: When appropriate, please indicate if you used old-school tables, your calculator, Python, etc

1. Find the area under the standard normal distribution curve for the following intervals. Please write your answer using 4 decimal places.
   a. Between $z = 0$ and $z = 2.0$
   b. To the right of $z = 1.26$
   c. To the left of $z = -0.8$
   d. Between $z = -1.47$ and $z = 2.39$

2. If quiz grades are normally distributed with a mean of 85 and a standard deviation of 8.0, what is the probability that a student will have a quiz grade of 95 or greater?

3. The amount of Dr. Pepper dispensed by a soda machine is normally distributed with a mean of 63.0 oz and a standard deviation of 1.25 oz. If the cups hold 64.0 oz, what is the probability that a randomly selected cup will be overfilled?

4. A company manufactures LED light bulbs. The lifetime for these bulbs is 4,600 hours with a standard deviation of 250 hrs. What lifetime should the company promote for these bulbs, so that only 3.0% of them burnout before the claimed lifetime?

5. The average life of an electric scooter is 13 years with a standard deviation of 1.5 years. The manufacturer replaces for free all scooters that fail while under a guarantee. If she is willing to replace 5.0% of the scooters that fail, how long of a guarantee (in years) should she offer? You may assume that the lives of the scooters are normally distributed.