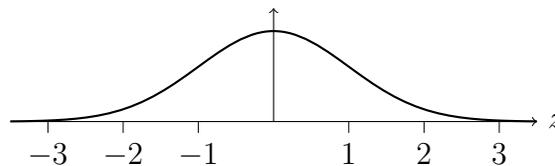


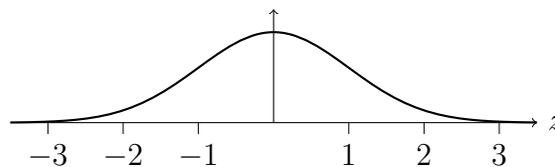
A TI-83/84 calculator allowed.

Problem 1: Evaluate each of the following probabilities from a standard normal probability distribution using either the tables or your graphing calculator. In either case, label the relevant value(s) on the z -axis and shade corresponding area. State calculator command and entries if you use the calculator. Round to 4 decimal places.

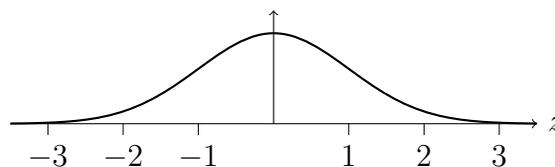
a. $P(Z < -1.2) =$



b. $P(Z \geq -0.58) =$

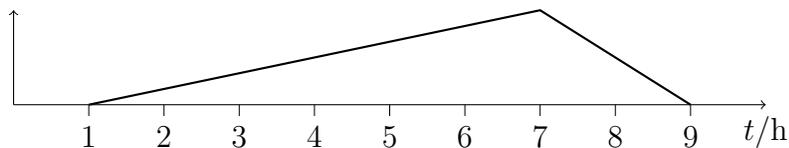


c. $P(1.43 \leq Z < 2.35) =$



Score: ____/6

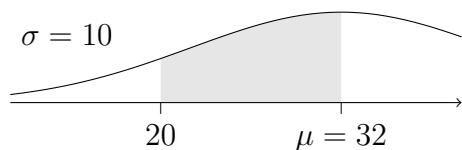
Problem 2: Suppose that the distribution of the hours of sleep per night for university students during final exam period is given by the graph shown. What proportion of university students get at most 5 hours of sleep per night during the finals?



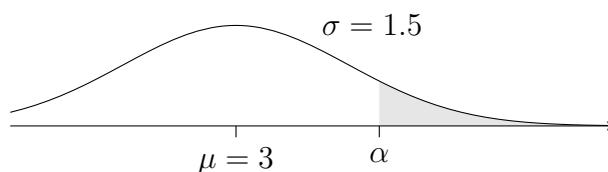
Score: ____/3

Problem 3: For the normal probability distributions with their corresponding mean and standard deviation, find the value of the variable indicated in each. State calculator command and entries for each part. Round to 4 decimal places.

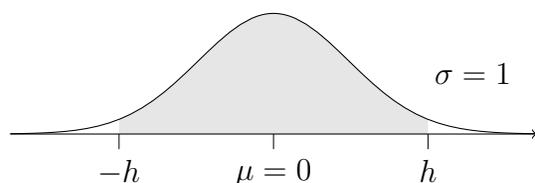
- a. Find the area of the shaded region.



- b. Find α if the shaded region has area 0.1020.



- c. Find h if the shaded region has area 0.9600.



Score: /6

Problem 4: Find the third quartile of the standard normal distribution to 4-decimal place accuracy.

Score: /2

Problem 5: The number of hours a student is on the internet each day is normally distributed with a mean of 5.6 hours and a standard deviation of 1.8 hours.

- What percentage of students uses the internet for less than 5.6 hours each day?
- What is the probability that a randomly selected student is on the internet more than 10 hours each day?
- Ninety percent of the students uses the internet for less than how many hours?
- Eighty percent of the students uses the internet between 5.6 plus or minus how many hours?
- For our class of 26 students, what is the probability that their average internet usage per day is between 5 and 6 hours?

Score: /7

Problem 6: Regarding Canadian airport security, in a random sample of 405 workers with access to restricted areas, 10 had criminal ties.

- a. Use the sample results to find a 95 % confidence interval for the proportion of workers with access to restricted areas of Canadian airports who have criminal ties. Present the results of your CI calculation in complete sentence form with specific reference to this application.

- b. Suppose there are 113 000 workers with clearance to airport restricted areas in Canada, up to how many workers with criminal ties have access to restricted areas?

Score: /5

Problem 7: The weekly weight of garbage generated per household is known to follow a normal distribution. A random sample of 10 households found these weights in kilograms:

2.1 5.8 3.9 4.2 3.1 7.8 6.4 4.9 4.7 5.1

Construct a 90 % confidence interval estimate of the average weekly weight of garbage per household.

Score: /5

Problem 8: In a CBC poll during Cycle to Work Week, it was found that 2% of Richmond residents cycles to work. How large a random sample is needed to estimate the percentage of Richmond residents that cycles to work if the estimate is to be accurate within 2% at the 90% confidence level?

Score: /3

Problem 9: A veggie sticks manufacturer weighed 90 bags of veggie sticks where each bag had an advertised weight of 80 grams. The weights of the sample had a mean of 81.4 grams and a standard deviation of 2.3 grams.

- a. Based on this sample, construct a 98% CI for the mean weight of all bags of veggie sticks of the above type.

- b. How large a random sample is needed to be 99.5% confident that the sample mean weight is within 1 gram of the mean weight of all bags of veggie sticks with advertised weights of 80 grams? What assumption did you have to make to come up with this number?

Score: /5