MATH 141:502 – Quiz 9 21 November 2019

Name and NetID:

Question 1. Let X be a normally distributed random variable measuring the average daily heat dissipation of a household. Given that X has mean $\mu = 4$ and $\mathbb{P}(X \leq 5) = 0.88$, determine the probability that at least 3 units of energy are dissipated in a chosen day. (Hint: use that the normal distribution is symmetric about the mean) *[3]*

Question 2. Calculate the accumulated value after eight years on a principal of \$2700 given a nominal interest rate of 3.5% compounded every 6 months. *[3]*

Question 3. The grades of students in a MATH141 class are normally distributed with mean $\mu = 74$ and variance $\sigma^2 = 38$. If X is the random variable denoting the grade value of a randomly chosen student, calculate $\mathbb{P}(67 \leq X \leq 89)$ to four decimal places. *[4]*

Bonus Question. Suppose X is a normal random variable with $\mu = 120$ and $\sigma = 75$.

1. Find the values of $\mathbb{P}(X < 65)$, $\mathbb{P}(X > 170)$, and $\mathbb{P}(50 < X < 145)$. *[3]*
2. Approximately draw this normal curve and make a sketch of the area under the curve corresponding to each of these probabilities. *[3]*