

MATH 134 – Calculus With Fundamentals 2
Discussion – Normal Probabilities using Tabulated Values
April 10, 2018

Background

Probabilities for a standard normal random variable (i.e. normal distribution with $\mu = 0$, $\sigma = 1$) are given in the table on the back of this sheet.

Important Fact: If Y is normal with mean μ and standard deviation σ , then

$$Z = \frac{Y - \mu}{\sigma}$$

is standard normal, and the table can be applied to Z . In today's discussion, you will practice using the table to answer questions about normally distributed quantities.

Discussion Questions

A) Approximate the area given by

$$\int_0^1 \frac{1}{\sqrt{2\pi}} e^{-x^2/2} dx$$

using a Riemann sum with $N = 5$. How close is your value to the table value .3413? What would you need to do to get a more accurate value?

B) Let Z be a standard normal.

- 1) Find $P(-2.13 < Z < -0.56)$
- 2) Find c such that $P(Z > c) = .05$

C) Y is normally distributed with mean $\mu 6$ and $\sigma = 2$. Find

- 1) $P(6 < Y < 7)$
- 2) $P(7 < Y < 8)$

D) SlimMints (yum!) are sold in two-packs with a stated label weight of 20.4 grams. The actual weights of the packages are normally distributed with mean $\mu = 21.37$ and variance $\sigma^2 = .16$. Let Y be the weight of a single package selected at random from the production line. What is the probability $P(Y > 22.07)$?

Assignment

Group writeups due at end of class.