Attendance 1-A

MANE 3332.05

Lecture 15

Agenda

- Midterm Review
- Major Quiz Announcement
  - All Part One Quizzes will be modified to two attempts and highest grade counted
  - Deadline for completing Part One Quizzes is 10/23/2025 3:30 PM
- Schedule
- Attendance
- Questions?

Tuesday Date and Topic(s)	Thursday Date and Topic(s)
10/21: Midterm Review	**10/23:** Midterm Exam

Handouts

Lecture 15 slides (Powerpoint)

Lecture 15 slides - marked (pdf)

Class Schedule

Midterm Exam

- You will have 75 minutes (3:30 - 4:45 PM)
- Bring a calculator → $n!$ $_nC_r$ $\ln$ e^x
- You may bring a single 4 inch by 6 inch notecard with handwritten notes
- You will be provided:
  - Midterm Exam
  - Akindi Answer sheet
  - Test 1 Handouts (see contents in Stuff folder)
- You will submit:
  - Midterm Exam
  - Akindi Answer Sheet

Strategies

- Take a minute or two scan test and look at point values
- Seek to maximize points
- Don’t start at beginning and try to grind through test
- Work problems in exam for partial credit
  - Solutions should contain formula, formula with values/parameters, and finally answer.

Chp 4!

uniform, std. normal, normal,

exponential, Weibull

Exam Content

- Anything that I did in class
  - Lectures 1 - 13
  - Chapters 1 - 4 in textbook
- Practice Problems are an excellent method to study: Single Event, Two Events, CDF, binomial, Poisson, standard normal, normal, and exponential,
- Should be prepared to work: discrete uniform, binomial distribution by hand, hypergeometric distribution, geometric distribution, negative binomial distribution, mean and variance of discrete random variables, continuous uniform distribution, mean and variance of continuous random variables, Weibull distribution
- Approximately, 85 to 90 percent of the exam will be application problems like the practice problems
- Approximately, 10 to 15 percent of the exam will be recognition
- Review the old Test 1 provided in the Supplemental Material widget

(a) (3 points) Find $P(A)$. Enter your answer in Akindi form line 2.

A. 0.004

B. 0.146

C. 0.850

D. 0.226

E. Correct answer is not provided

Column 3 total 2

$P(A) = \frac{2}{500} = .004$

(b) (5 points) Let X be a discrete random variable with cumulative distribution function, $F(x)$. Find $P(3 < X < 10)$. Enter your answer in Akindi form line 8.

A. $F(9) - F(3)$
B. $F(9) - F(4)$
C. $F(10) - F(3)$
D. $F(10) - F(4)$
E. Correct answer is not provided

what values of x?

$x \in \{4, 5, 6, 7, 8, 9\}$

4 - 1

$F(9) - F(3)$

$3 \leq x < 10$

$3 < x \leq 10$

(b) (5 points) Let X be a Poisson random variable with parameter $\lambda = 4.047$, find $P(X \geq 3)$. Enter your answer in Akindi form line 12.

A. 0.193

B. 0.2313

C. The correct answer is not provided

D. 0.5757

E. 0.7687

$P(X \geq 3) = \sum_{i=3}^{\infty} f(i)$ → $1 - F(2)$

$f(x) = \frac{e^{-\lambda} x^x}{x!}$

$= 1 - \{ f(0) + f(1) + f(2) \}$

(a) (5 points) Let Z be a standard normal random variable, find $P(-1.2 < Z < -0.47)$.
Enter your answer in Akindi line 13.

A. 0.680822

B. 0.163039

C. 0.11507

D. The correct answer is not provided

E. 0.795892

$P(-1.2 < Z < -.47) = \Phi(-.47) - \Phi(-1.2)$

(b) (5 points) Let Z be a standard normal random variable, find the value of z such that $P(Z > z) = 0.3974$. Enter your answer in Akindi line 14.

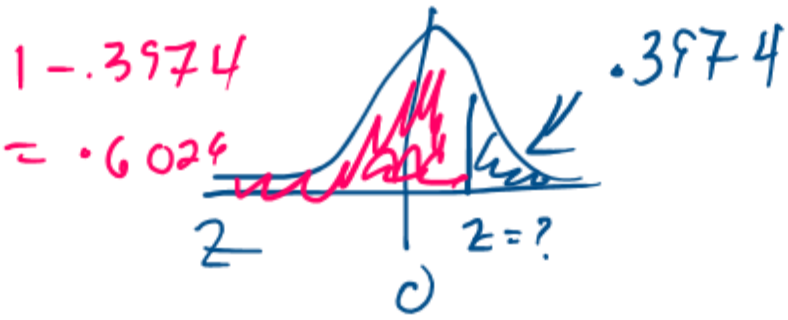
A. -0.26

B. The correct answer is not provided

C. 0.26

D. -0.84

E. 0.84



(a) (5 points) Let X be a normal random variable with mean $\mu = 87.172$ and standard deviation $\sigma = 2.182$, find $P(X > 86.852)$. Enter your answer in Akindi line 15.

A. a. 0.5

B. 0.394479

C. The correct answer is not provided

D. 0.440382

E. 0.559618

$$P(X > 86.852) = P\left(Z > \frac{X - \mu}{\sigma}\right)$$

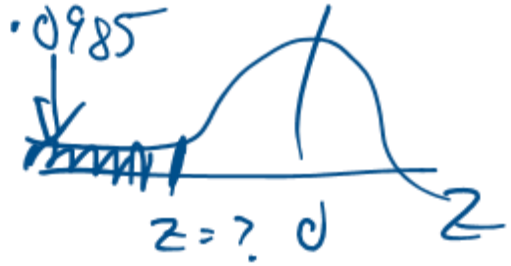
$$= P\left(Z > \frac{86.852 - 87.172}{2.182}\right)$$

$$= P(Z > -.147)$$

$$= 1 - \Phi(-.15)$$

(b) (5 points) Let X be a normal random variable with mean $\mu = 25.231$ and standard deviation $\sigma = 3.598$, find the value x such that $P(X < x) = 0.0985$. Enter your answer in Akindi line 16.

A. The correct answer is not provided
B. 29.872
C. -1.29
D. 39.623
E. 1.29



$$z = -1.29 \Rightarrow z = \frac{x - \mu}{\sigma}$$

$$-1.29 = \frac{x - 25.231}{3.598}$$

(a) (5 points) Suppose an exponential random variable has $\lambda = 8.32$, find $P(0.0082 < X < 0.1556)$. Enter your answer in Akindi line 17.

A. 0.9341

B. 0.66

C. -5.4915

D. 0.726

E. The correct answer is not provided

$F(.1556) - F(.0082)$

$F(x) = 1 - e^{-\lambda x}$

$= 1 - \exp[-\lambda x]$

(b) (5 points) Let X be an exponential random variable with $\lambda = 0.751$. Find the value x such that $P(X < x) = 0.429$. Enter your answer in Akindi line 18.

A. 1.1269

B. The correct answer is not provided

C. 0.7462

D. 0.2754

E. 1.1276

$$F(x) = .429$$

$$1 - e^{-\lambda x} = .429$$

$$e^{-\lambda x} = .571$$

$$\ln\left(e^{-\lambda x}\right) = \ln .571$$

$$-\lambda x = \ln .571$$

Weibull

$$F(x) = 1 - \exp\left[-\left(\frac{x}{\delta}\right)^{\beta}\right]$$

$$= 1 - e^{-\left(\frac{x}{\delta}\right)^{\beta}}$$

Quiz Announcements

- All quizzes have been re-opened and students will be allowed two attempts
- Your quiz score will be calculated using the highest score of the two attempts
- The deadline to complete the quizzes is **Thursday October 23, 2025 3:30 PM**
- **Do not expect this treatment for quizzes offered in the second half of the course**