Bunker Hill Community College
imagine the possibilities

MATH 181 FIRST EXAM PRACTICE C

SPRING 2019

Name: ANSWER KEY

- Write your **full name** on the line above.
- Show your work. Incorrect answers with work can receive partial credit.
- Attempt every question; showing you understand the question earns some credit.
- If you run out of room for an answer, continue on the back of the page. Before doing so, write "see back" with a circle around it.
- You can use 1 page (front and back) of notes.
- You can use (and probably need) a calculator.
- You can use the Geogebra Scientific Calculator instead of a calculator. You need to put your phone on **airplane mode** and then within the application, start **exam mode**; you should see a green bar with a timer counting up.
- If a question is confusing or ambiguous, please ask for clarification; however, you will not be told how to answer the question.
- **Box your final answer**.
- A formula sheet is attached to this test.

Do not write in this grade table.

Question:	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	Total
Points:	10	10	5	5	10	10	10	10	70
Score:									

Sample statistics:

n = sample size
x_i = the ith value in a sample
$\bar{x}$ = sample mean
s = sample standard deviation

Q_1 = first quartile
m = median
Q_3 = third quartile
IQR = inter-quartile range = $Q3 - Q1$

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$

Population parameters:

μ = population mean
σ = population standard deviation

Probability:

Ω = set of all possible equally likely outcomes
A = event A, a set of outcomes
A^c = The complement of A
B = event B, another set of outcomes
$|A|$ = size of set, number of outcomes in A
$P(A)$ = probability of A
$P(A \text{ AND } B)$ = probability of both A and B
$P(A \text{ OR } B)$ = probability of either A or B (or both)
$P(A|B)$ = probability of A given B

$$P(A) = \frac{|A|}{|\Omega|}$$

$0 \le P(A) \le 1$
$P(A \text{ AND } B) = P(A) \cdot P(B|A)$
$P(A \text{ OR } B) = P(A) + P(B) - P(A \text{ AND } B)$
$P(A^c) = 1 - P(A)$

A, B are disjoint (mutually exclusive) $\iff$ $P(A \text{ AND } B) = 0$
A, B are non-disjoint $\iff$ $P(A \text{ AND } B) > 0$
A, B are exhaustive $\iff$ $P(A \text{ OR } B) = 1$
A, B are complements $\iff$ A, B are disjoint and exhaustive $\iff$ $B = A^c$
A, B are independent $\iff$ $P(A \text{ AND } B) = P(A) \times P(B)$ $\iff$ $P(A|B) = P(A)$

Random variables and distributions:

X = random variable
x_i = the ith possible value of X. (Notice different meaning here vs. sample statistics.)
k = number of possible values of X.
$E(X) = \mu$ = expected value of X
σ = standard deviation of X
$\mu = \sum_{i=1}^{k} x_i \cdot P(X = x_i)$
$\sigma = \sqrt{\sum_{i=1}^{k} (x_i - \mu)^2 \cdot P(X = x_i)}$