Name: _____ July 21, 2017

FINITE MATH: QUIZ 8

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- The Honor Code is in effect for this quiz. All work must be your own.
- Please turn off all cellphones or any other electronic devices.
- Calculators are allowed. Give your answers to 1-3 decimal places.
- There are 11 points available to try for. It is NOT possible to get more than 10 points on this quiz.
- The quiz lasts 12 minutes.

Useful Formulas

- $\mu = \bar{x} = \dfrac{x_1 + x_2 + \cdots + x_n}{n}$ (population or sample mean)
- $\sigma^2 = \dfrac{(x_1 - \mu)^2 + (x_2 - \mu)^2 + \cdots + (x_n - \mu)^2}{n}$ (population variance)
- $s^2 = \dfrac{(x_1 - \mu)^2 + (x_2 - \mu)^2 + \cdots + (x_n - \mu)^2}{n - 1}$ (sample variance)
- stdev $= \sqrt{\text{variance}}$
- $E(X) = x_1 \cdot p(x_1) + x_2 \cdot p(x_2) + \cdots + x_n \cdot p(x_n)$
- $E[u(X)] = u(x_1) \cdot p(x_1) + u(x_2) \cdot p(x_2) + \cdots + u(x_n) \cdot p(x_n)$
- $E(c) = c$ for constants
- $E[c \cdot u(X)] = c \cdot E[u(X)]$ for constant c and function $u(X)$
- $E[c \cdot u(X) + v(X)] = c \cdot E[u(X)] + E[v(X)]$ for constant c and functions u, v
- $Var(X) = (x_1 - \mu)^2 \cdot p(x_1) + (x_2 - \mu)^2 \cdot p(x_2) + \cdots + (x_n - \mu)^2 \cdot p(x_n)$
- $Var(X) = E(X^2) - [E(X)]^2$

Problem 1. Consider the following length (in inches) of a **randomly selected sample** of 5 adult male Betta fish from a large population: 2.23 1.88 2.47 2.19 1.80.

a) (1pt) Calculate the mean.

b) (2pt) Calculate the variance.

c) (1pt) Calculate the standard deviation.

Problem 2. A game involves tossing an unfair coin, with $P(T) = 0.8$. The house charges players x dollars for the opportunity to play the game. If player tosses Tails, he gets nothing and the house keeps his bet. If the toss is Heads, he gets his money back, plus an additional \$5.

a) (2pt) How much should the house charge per game to break even?

b) (3pt) How much should the house charge per game to make an average of \$1 dollar profit per game?

Problem 3. (2pt) A random variable X is known to have $E(X) = 4$ and $E(X^2) = 25$. Find the variance and the standard deviation of X.