

Math 1070 Exam #2 Review



1. Arsenic is a compound that occurs naturally in very low concentrations. Arsenic blood concentrations in healthy adults are normally distributed with mean $\mu = 3.2$ micrograms per deciliter (mg/dl) and a standard deviation $\sigma = 1.5$ (mg/dl).

(a) A healthy adult is randomly selected, find the probability the adult has between 2 and 4 micrograms per deciliter of arsenic in their blood.

(b) Find the top 5% of arsenic concentrations in healthy adults.

2. The 2014 New England Patriots had an amazing year ending with a Super Bowl win. Let's compare how the Patriot's offense performed on the road versus at home. Below; are the number of points scored by the offense on the road and at home:

Road: 20, 30, 14, 37, 42, 21, 23, 17

Home: 16, 43, 27, 51, 43, 34, 41, 9

(a) Compute the mean, variance, and standard deviation for the points scored at home (do this "by hand")

(b) Suppose the mean and standard deviation for the Patriots offense on the road was 25.5 points and 9.26 points. Using this information and your answers from part (a), did the Patriots perform better on the road or at home and were the Patriots more consistent on the road or at home? Explain.

3. (a) You are trying to save for a new car and decide to deposit \$10,000 into a 2 year CD at Charter Oak Credit Union earning 1.48% compounded quarterly. How much money will you have saved after the 2 years?

(b) Repeat the question with daily compounded interest and compare.

4. Suppose you deposit a fixed amount of money every month for 5 years into an account with an annual interest rate of 2.75% compounded monthly. After 5 years, you stop depositing money and let the money in the account gain interest for the next 5 years, still at an annual rate of 2.75% compounded monthly. If the total amount in the account at the end of the 10 years is \$7369.98 what were the payment amounts to be made during the first five years?

5. Solve the following system of equations using your choice of method:

$$-5x + y = -3 \quad 3x - 8y = 24$$

6. Isiah Thomas from the Boston Celtics in the 2016-2017 season has made 82.7% of his free throws. Let X be the number of free throws made.

(a) Suppose Isiah attempts 5 free throws in a game, find the probability he makes exactly 4 of them.

(b) Construct a probability distribution for X .

(c) Find the expected number of free throws made.

7. Winston McCall is purchasing a home for \$250,000. Charter Oak Credit Union has a 15 year fixed rate loan at 2.875%. The bank is requiring a 15% down payment. Find the down payment for the mortgage, the monthly payments, the total amount to be paid back, as well as the amount of interest to be paid.

8. A baker will supply 16 jumbo cinnamon rolls to a café at a price of \$1.70 each. If she is only offered \$1.50, then she will supply 4 fewer rolls to the café. The café's demand for jumbo cinnamon rolls is given by $p = D(x) = -0.16x + 7.2$.

a) Find the supply equation $p = S(x)$.

b) Find the equilibrium price and quantity.