Quiz 6 6.3 Math 15 Jones Name_____

For each part draw a normal distribution with a region that has area equal to the desired probability shaded.

1) (12 Points) The distribution of weights of discarded glass for families of 4 is normally sdistributed with a mean of 6 pounds and a standard deviation of 2.5 pounds.
a) (2 Points) Graph the distribution with both an x–axes and a z–axes. Show mean and standard deviation. Calculate the z–score of a family with 8 poinds of garbage.Label both x and z on your graph.

b) (2 Points) What is the probability that a family will have at least 8 lbs? Show all work.
Use proper probability notation, calculator inputs and shade region with equal area on the graph above.
Would it be unusual to get a family with at least 8 lbs?

c) (2 Points) What weight separates the largest 15% of households?
Show graph shade corresponding region and label x and z.

d) (2 Points) On a given day the insprector samples 25 homes, and finds the sample mean. Use the Central Limit Theorem to find the mean $\mu_{\bar{x}}$ and standard deviation $\sigma_{\bar{x}}$ of the population of sample means for samples of size $n = 25$.

e) (1 Points) Find the z–score of a sample mean $\bar{x} = 8$ lbs in this sampling distribution.

f) (3 Points) For a sample of size 25, what is the probability that the sample **mean** family will beat lease 8 lbs? Graph the distribution of sample means when the sample size is 25 with both an $\bar{x}$–axes and a z–axes. Label $\bar{x}$, z and shade the region with the desired probability. Would it be unusual to get a sample of 25 homes that have a mean weight of 8 pound of discarded glass?

Find the indicated critical z value.

2) (2 Points) Find the critical value $z_{0.02}$

Draw the corresponding normal distribution and label the area and z–score.

Provide an appropriate response.

3) (6 points) Samples of size $n = 1500$ are randomly selected from the population of numbers (0 through 9) produced by a random–number generator, and the proportion of odd numbers is found for each sample. According to the Central limit theorem for proportions,

a) What is the shape of the distribution of the sample proportions?

b) What is the mean of the distribution of sample proportions?

c) What is the standard deviation of the distribution of sample proportions?
(Give the correct symbolic variable.)

d) Graph and label the distribution of sample proportions with a $\hat{p}$ and z axis.