STATISTICS 1040 **Name** _____
Quiz 7, Fall 2014 **Recitation Instructor** _____ **Time**_____

1. Draw 400 times with replacement from the box $\left[\boxed{5}\ \boxed{7}\ \boxed{8}\ \boxed{9}\ \boxed{11}\right]$.

a) How small can the sum of the draws be? How large? (2 points)

2000 , 4400

b) What do you expect the sum of the draws to be? (2 points)

$EV\ for\ sum\ =\ Box\ AV\ \times\ number\ of\ draws\ =\ 8\times 400 = 3200$

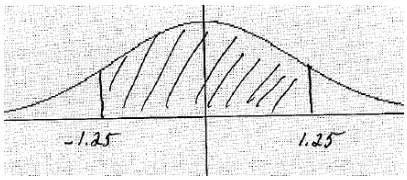
c) If the *sum of the draws = expected value + chance error*, how big is the chance error likely to be? (You may use the fact that the box SD is 2.) (2 points)

The SE for the sum of draws is the likely size of the chance error

$SE\ for\ sum\ =\ Box\ SD\times\sqrt{number\ of\ draws}\ =\ 2\times\sqrt{400}\ =\ 40$

d) Find the probability that the sum of the draws is between 3150 and 3250. (2 points)

$Use\ the\ Normal\ Approximation:\ \dfrac{3150-3200}{40}\ =\ -1.25\ ,\ \dfrac{3250-3200}{40}\ =\ +1.25$



$A(1.25)\ =\ 79\%$

e) Find the probability that the number of $\boxed{7}$ s drawn is greater than 84. (2 points)

To count the number of 7s we need a new box model:

Draw 400 times from the box $[1, 0, 0, 0, 0]$ *and consider the sum of the draws.*

$Box\ AV = \dfrac{1}{5}\ ,\ Box\ SD = \sqrt{\dfrac{1}{5}\times\dfrac{4}{5}}\ = \dfrac{2}{5}\ ,\ EV\ for\ sum = \dfrac{1}{5}\times 400 = 80\ ,\ SE\ for\ sum = \dfrac{2}{5}\times\sqrt{400} = 8$

We use the normal approximation: $\dfrac{84-80}{8}\ =\ .5\ ,\ A(.5) = 38\%\ ,$ *So the probability that the number of 7s is greater than 84 is about 31%.*