Yiqiao Jin
UID: 305107551
Section 1C

7.4
μ is 2.78 and x is 2.93

7.6
No. Because typical members of men's basketball team are taller than normal male students, the sample is not representative of the entire population. This is a sampling bias.

7.14
I will not get a representative sample. I am using voluntary response sampling, which will introduce significant bias to my sampling. Students with higher GPA are more likely to respond.

7.22
This will result in sampling bias. This is an example of convenience sampling, which will introduce significant bias. Since the sample is not representative, the resulting voluntary response bias invalidates the survey.

7.26
A. We should expect the percentage to be 9%
B. Standard error = $\sqrt{(0.09*0.91/1000)}$ = 0.009
C. We expect 9%, give or take 0.9%

7.28
C has the largest sample with its shape more similar to a bell shape. Thus C has the biggest size. By the same token, size of B>size of A
So sample size is: C>B>A

7.36
Z-score = (0.081-0.09) / 0.009 = -1
Based on the z-score, probability that random sample of 1000 letters will contain less than 8.1% t's is 15.87%

7.40
For the population parameter, we have p=0.04
So we expect 0.04*300 = 12 people to be vegan
SE = $\sqrt{(p*(1-p)/n)}$ = 0.011
The z-score for 15 is ((15-12)/300)/0.011=0.91. The probability is represented by the area to the right of z=0.91
There is a possibility of 0.181 for z>0.91, which is the probability that not enough vegan

meals are available.

7.48
A. 663/1004 = 0.66, So 66% said immigration is good
B.
Checking the conditions for a CLT:
1. Gallup polls are random samples, and people selected are independent
2. We have a large sample
$n*(1-p)=0.66*1004=341$, and $np = 663$. Both np and $n*(1-p)$ are greater than 10.
3. The population size is more than 10 times larger than the sample size.
So the precision and bias are independent of the population size
So we can apply CLT.
C. $SE = \sqrt{(p(1-p)/1004)} = 0.015$, For a 95% confidence interval, we need z-scores of 2 and -2. The Margin of error is $0.66+0.015*2 = 0.69$ and $0.66-0.015*2=0.63$. So a 95% confidence interval is between 0.63 and 0.69
CI (0.63,0.69)

7.50
A. We are 95% confident that the percentage of voters supporting Measure X is between 46% and 52%.
B. There is evidence that X will fail because the bounds of the confidence interval are above and below 50% respectively.
C. A sample surveyed in Miami is not representative of the population, which is the entire population of Florida. So the sample is worthless.

7.58
A. 15 digits. Because both odd and even digits have a change of 0.5 to appear in a line. We have $0.5*30 = 15$
B. I would expect $20\%*30 = 6$ students not capturing 50%. With a confidence interval of 80% I would expect 20% not capturing

7.62
A. 203/1974 = 10.3%. So 10.3% people believe the sun went around earth.
B.
$SE = \sqrt{(0.103*0.897/1974)} = 0.00684$
For a CI of 95% we expect the margin of error to be 2 SE from the mean
$0.00684 * 2 \approx 0.01367$
So 95% CI(0.089, 0.1164)
C. This is not plausible because 0.3 is not in the CI.

7.64
This means we are 95% confident that the difference between percentage of Republicans and Democrats agreeing on the statement is between -0.13 and -0.02. The negative values indicate that by prediction, democrats who agree with this statement is

less than those of republicans.

7.68
A. For preschool: 16/32 = 0.50
For no preschool: 21/39 = 0.54
This does NOT suggest that preschool was linked with a higher graduation rate.

B.
1. The participants were randomly assigned to the two groups
2. Each sub-group has size greater than 10
3. The population is more than 10 times larger than the sample size

C. iii
D. A 99% CI will be wider since it covers more data points.