Yiqiao Jin
UID: 305107551
Section 1C

8.2
Measurements are made on a sample, and generalization are made to a population

8.14
H0: p=0.33; 33% of cars sold are SUVs;
Ha: p<0.33; fewer than 33% of cars sold are SUVs
For the sample: 145/500 = 0.29
Z=-1.9022

8.28
A, since a change in proportion should be reflected as variations on both sides of the graph.

8.34
In figure A, the shaded area could be a p-value because it includes tail areas only. This is a left-tailed one-sided alternative hypothesis
It represents p-value for a one-sided H_a

In figure B, the shaded area could be a p-value because it includes tail areas only. This is a right-tailed one-sided alternative hypothesis
It represents p-value for a one-sided H_a

8.36
Step1:
H0: p=0.5
Ha: p>0.5
Step 2:
We use a one-proportion z-test and random sample with independent measurement.
We have a large sample size: n*p0≈1001 >10, n*(1-p0)≈1000 >10
The population needs to be greater than 10 times the sample size: satisfied
significance level=0.05
Step 3:
Sample proportion **p** = 0.62
SE = √(p0*(1-p0)/n) = 0.0111
z-score = (0.62-0.5)/0.0111=10.736
Based on the z-table, the p-value is less than 0.0002, which is less than 0.05
Since p < 0.05, we can reject H0 that

8.38
Step1:

H0: $p=0.5$; Ha: $p\neq 0.5$, where p is the population proportion of plane crashes due in part to pilot error.

Step2: We adopt a one proportion z-test

np=0.5*100=50>10; n(1-p)=0.5*100=50>10; so we have large samples.

population size is 10 times greater than sample size, so we have a large population

Step3:

$SE=\sqrt{(0.5*0.5/100)}=0.05$

$Z=(0.62-0.5)/0.05=2.4$, p-value=0.0082*2=0.0164<0.05

Step4:

Therefore, we can reject H0 and choose ii

8.44

H0: $p=0.5$ and Ha: $p\neq 0.5$

A is the p-value corresponding to 16 heads while B corresponds to 18 heads. A p-value closer to 1 means H0 is more likely to be valid, which is represented by greater tail area as represented in A. In this case p=0.5 yields 15 heads, which is closer to 16.

8.50

The sample size is 5, and np=n(1-p)=2.5 which is smaller than 10

Since we don't have a large enough sample size, her approach is invalid.

8.56

We cannot "accept" null hypothesis because we are never 100% sure that the null hypothesis is true. We don't know whether H0 is true or not. We can just find evidence to reject it.

8.62

A larger sample size will decrease standard error, thus increasing the corresponding z value. As z-value increases, p decreases. To get a small p-value, you need a larger sample size.

8.68

55/230=0.239

42/174=0.241

Since 0.239<0.241, it is necessary to do a hypothesis test.

p=(55+42)/404=0.24

H0: $p1=p2$

Ha: $p1<p2$

$SE=\sqrt{(p*(1-p)(1/n1+1/n2))}=0.043$

Z=(estimate-null value)/SE = (0.241-0.239)/0.043=-0.0483

Based on the z table, p-value is 1-0.5199≈0.48 for the two sides altogether, which is much greater than 0.05. So we fail to reject Ha and cannot conclude that counseling lowered the arrest rate.

8.72

A. Two-proportion z-test

One population is all men going to the supermarket; the other population is all women going to the supermarket

B.One proportion z-test

The population is all people taking the Oregon bar exam

8.86

It would not be appropriate to do such a test, because the data were the entire population of employed men and women. These are not samples, so inference is not reasonable.