Name: _____

Period: _____

8.1 Hypothesis Testing

Each coin has been determined to be unfair with 95% confidence. The probability for each coin is given. Use a hypothesis test to determine if the probability is the correct probability for the coin. Take a sample of 15 flips for each coin.

There are 5 Steps in hypothesis testing:

Step 1 State the hypotheses and identify the claim
Step 2 Find the critical value(s)
Step 3 Compute the test value
Step 4 Make the decision to reject or not reject the null hypothesis (H_0)
Step 5 Summarize the results

Before we can start a hypothesis test, we need to collect all the data.

Coin 0: P(Heads)= .5 α = ___ *P(Heads) must be given to you. α is 1 – C.I.*

Sample *Collect your sample by flipping Coin 0 15 times. Record H or T in the boxes*

Step 1 What is your null hypothesis (H_0)? What is your alternate hypothesis (H_1)?

H_0 : _____ *What were you given about Coin 0?*

H_1 : _____ *If H_0 is wrong, then what is left over?*

Step 2 Use the `binompdf(` function that we learned about in chapter 5, to calculate the theoretical probability of getting each outcome, from 0 to 15 heads. If you want to save time, make `x` a list of numbers `{0,1,2 … 15}` and use the function `binompdf(15, .5, x)`. Record your data in the table.

Probability: `binompdf(15, .5, x)`

x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P(x)																

Now, we need to find where the critical values lie. The confidence level was given as 95% so the noncritical region is .95 of your data and the critical region is .05 of your data. That means the probabilities in all your flips in the critical region added together cannot be more than .05. Since this is a two-tail test (you did put P(heads) ≠ .5 for H_1, right?), there is a critical region on the left end, and one on the right, and they cannot be bigger than .025. Add the probabilities up starting from the left, and as long as you don't go over .025, you are still in the critical region. When you add to over .025, that means you crossed the critical value, so put a mark there and you have found the left-sided critical region. Now do the same for the right side.

Step 3 Nothing to compute for this data, just count.

Test Value: # of heads: _____ *How many heads did you get in your sample?*

Step 4 Is the test value in the critical region or not?

Reject or Not Reject *If it is in the critical region, that is bad, so reject H_0.*

Step 5 Summarize what you just found out.

We reject or do not reject that the coin has a probability of flipping heads of .5 because _____
_____

Data

Coin 1: P(Heads)= .49 α = ___

Sample

Step 1 H_0 : _____

H_1 : _____

Step 2 Probability: `binompdf(15, .49, x)`

x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P(x)																

Step 3 # of heads: _____

Step 4 Highlight critical region

Step 5 Summarize results: _____
_____

Data

Coin 2: P(Heads)= .46 α = ___

Sample

Step 1 H_0 : _____

H_1 : _____

Step 2 Probability: `binompdf(15, .49, x)`

x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P(x)																

Step 3 # of heads: _____

Step 4 Highlight critical region

Step 5 Summarize results: _____
_____

Data
Coin 3: P(Heads)= .42 α = ____
Sample

Step 1 H_0 : _____
H_1 : _____
Step 2 Probability: `binompdf(15, .49, x)`

x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P(x)																

Step 3 # of heads: _____

Step 4 Highlight critical region

Step 5 Summarize results: _____
_____

Data
Coin 4: P(Heads)= .4 α = ____
Sample

Step 1 H_0 : _____
H_1 : _____
Step 2 Probability: `binompdf(15, .49, x)`

x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P(x)																

Step 3 # of heads: _____

Step 4 Highlight critical region

Step 5 Summarize results: _____
_____

Data

Coin 5: P(Heads)= .38 α = ____

Sample

Step 1 H_0 : _____

H_1 : _____

Step 2 Probability: `binompdf(15, .49, x)`

x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P(x)																

Step 3 # of heads: _____

Step 4 Highlight critical region

Step 5 Summarize results: _____

_____

Data

Coin 6: P(Heads)= .35 α = ____

Sample

Step 1 H_0 : _____

H_1 : _____

Step 2 Probability: `binompdf(15, .49, x)`

x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P(x)																

Step 3 # of heads: _____

Step 4 Highlight critical region

Step 5 Summarize results: _____

_____

Data

Coin 7: P(Heads)= .32 α = ____

Sample

Step 1 H_0 : _____

H_1 : _____

Step 2 Probability: `binompdf(15, .49, x)`

x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P(x)																

Step 3 # of heads: _____

Step 4 Highlight critical region

Step 5 Summarize results: _____
_____

Data
Coin 8: P(Heads)= .30 α = ____
Sample

Step 1 H_0 : _____
H_1 : _____
Step 2 Probability: `binompdf(15, .49, x)`

x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P(x)																

Step 3 # of heads: _____

Step 4 Highlight critical region

Step 5 Summarize results: _____
_____

Data
Coin 9: P(Heads)= .25 α = ____
Sample

Step 1 H_0 : _____
H_1 : _____
Step 2 Probability: `binompdf(15, .49, x)`

x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P(x)																

Step 3 # of heads: _____

Step 4 Highlight critical region

Step 5 Summarize results: _____
_____