YEAR 1 APPLIED

Chapter 7 – HYPOTHESIS TESTING

Step 1. Make your hypothesis

$H_0: p =$	$H_0: p =$	$H_0: p =$
$H_1: p <$	$H_1: p >$	$H_1: p \neq$

Step 2. Find the probability of the sample, given normal circumstances

$P(X \leq x)$	$P(X \geq x)$	$P(X \leq x)$ or $P(X \geq x)$
one tail	one tail	Two tailed

Step 3. Compare probability of sample with given significant level

P(Sample) > significant level (1/2 significant level if 2 tailed)

Accept H_0

P(sample) < significant level (1/2 significant level if 2 tailed)

Reject H_0

Accept H_1

Step 4. Write a comment in context of the original problem.

Accept H_0 Not enough evidence to say the dice is biased

Accept H_1 There is enough evidence to suggest the dice is biased.

CRITICAL REGIONS

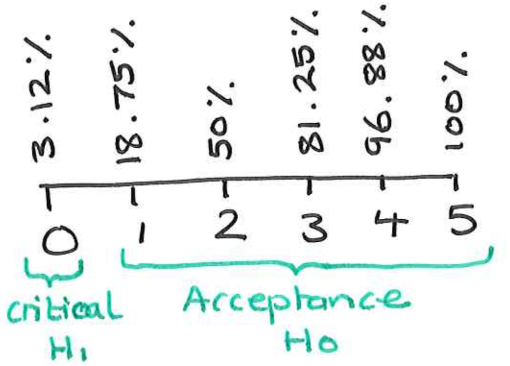
$H_0: p = 0.5$

$H_1: p < 0.5$

$p = 0.5 \quad n = 5$

X	$P(X \leq x)$
0	0.0312
1	0.1875
2	0.5000
3	0.8125
4	0.9688
5	1.0000

5% significant level



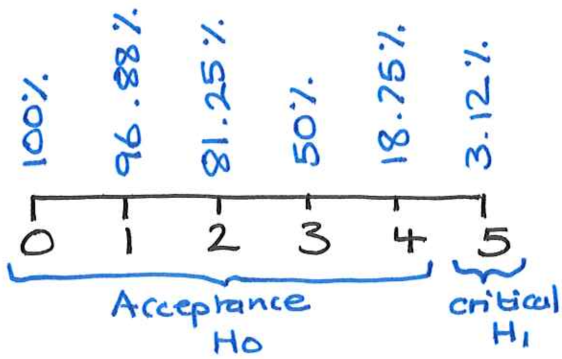
$H_0: p = 0.5$

$H_1: p > 0.5$

$p = 0.5 \quad n = 5$

X	$P(X \geq x)$
0	1.0000
1	0.9688
2	0.8125
3	0.5000
4	0.1875
5	0.0312

5% significant level



$H_0: p = 0.5$

$H_1: p \neq 0.5$

$p = 0.5 \quad n = 10$

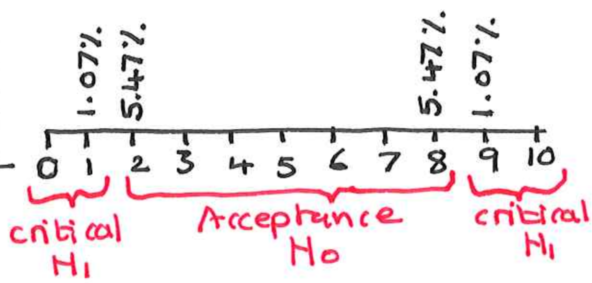
X	$P(X \leq x)$	$P(X \geq x)$
0	0.001	1.000
1	0.0107	0.999
2	0.0547	0.9893
⋮		
8	0.9893	0.0547
9	0.999	0.0107
10	1.000	0.001

5% signifiant level

2tail

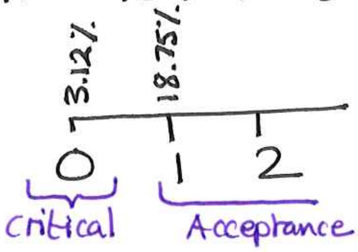
Bottom tail 2.5%

Top tail 2.5%



ACTUAL SIGNIFICANT LEVEL

5% significant level



3.12% Actual Significant Level