**7A Hypothesis Testing**

1. Imagine we believe that a dice is biased towards landing on 6s.

We roll the dice 20 times and get a 6 on 8 occasions

1. What is the test statistic for this situation?
2. Write a sensible null hypothesis for this situation
3. Write a sensible alternative hypothesis for this situation
4. A researcher wants to test, at the 5% significance level, whether the dice is biased

Under what conditions would we reject the null hypothesis?

1. What is the probability of getting 8 sixes when rolling a dice 20 times?

Imagine we had rolled 7 sixes instead…

Imagine we had rolled 6 sixes instead…

1. John wants to see whether a coin is unbiased, or whether it is biased towards coming down on heads. He tosses the coin 8 times and counts the numbers of times, $X$, that it lands heads up.
2. Describe the test statistic
3. Write down a suitable null hypothesis
4. Write down a suitable alternative hypothesis
5. An election candidate believe she has the support of 40% of the residents in a particular town. A researcher wants to test, at the 5% significance level, whether the candidate is overestimating her support. The researcher asks 20 people whether they support the candidate, and 3 say that they do.
6. Write down a suitable test statistic
7. Write down two suitable hypotheses
8. Explain the condition under which the null hypothesis would be rejected