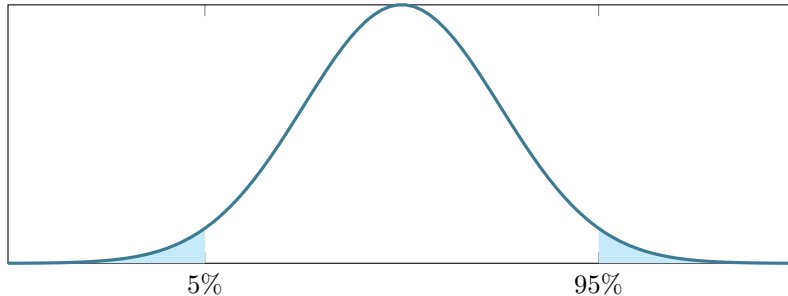


# Hypothesis testing

## 1 Performing a hypothesis test

Method	Example
<b>Establish the null and alternative hypothesis</b> ( $H_0$ and $H_1$ )	$H_0 : p = 0.5$ $H_1 : p > 0.5$
<b>Define the distribution under <math>H_0</math></b>	Under $H_0$ $X \sim B(15, 0.5)$
<b>Decide on the significance level</b>	5%
<b>Collect data, state the test statistic</b>	$X=12$
<b>Calculate the probability of obtaining the test statistic or a more extreme result</b>	$P(X \geq 12) = 1 - P(X \leq 11)$ $= 1 - 0.9824$ $= 0.0176$
<b>Compare this to the sig level as a decimal</b>	$0.0176 < 0.05$
<b>Interpret the results in terms of the original claim</b>	There is evidence to reject $H_0$ in favour of $H_1$ . The test is significant.

## 2 Finding the critical region



If the test statistic is found in the critical region  $H_0$  will be rejected

### 2.1 Finding the Lower critical value

$$P(X \geq c) < 0.95$$

$$1 - P(X \leq c - 1) < 0.95$$

$$P(X \leq c - 1) > 0.05$$

### 2.2 Finding the Upper critical value

$$P(X \geq c) < 0.05$$

$$1 - P(X \leq c - 1) < 0.05$$

$$P(X \leq c - 1) > 0.95$$

Then look these up in tables to find the critical values

