1A.

Alternative is that the birth rate of females is higher than males
Null is equal or less than males.

It is one-sided.

The test statistic we will use is the chi-squared,

1B.

```
> z = (0.563 - 0.5) / sqrt((0.5 * 0.5) / 1000)
> z
[1] 3.98447
```

The p-value for a one-sided test with a z-score of 3.98 is approximately 0.00003 using a z-table

1C.

Since the p-value is less than the maximum Type I error rate of 0.05, we can reject the null hypothesis.

2A.
Null: The population distribution of eye color is uniform.
Alternative: The population distribution of eye color is not uniform.

2B.

```
> chi_sq <- sum((c(22, 36, 42) - rep(100/3, 3))^2 / rep(100/3, 3))
>
> p_value <- 1 - pchisq(chi_sq, df = 2)
>
> cat("Chi-squared test statistic:", chi_sq, "\n")
Chi-squared test statistic: 6.32
> cat("p-value:", p_value, "\n")
p-value: 0.04242574
```

```
2C.
We will be rejecting the null hypothesis
```

3A.

null: there is no association between the political party affiliation and the response to the referendum question,

Alternative: there is an association between the two variables.

3B.

```
> table = matrix(c(156, 188, 45, 39, 264, 308), nrow = 3, byrow = TRUE)

> rownames(table) = c("For", "Indifferent", "Not For")

> colnames(table) = c("A", "B")

>

> rowTotals <- margin.table(table, 1)

> colTotals = margin.table(table, 2)

> n <- sum(table)

> expected <- round(outer(rowTotals, colTotals) / n, 2)

>

> testResult = chisq.test(table)

>

> table

              A   B

For         156 188

Indifferent  45  39

Not For     264 308

> expected

                 A      B

For         159.96 184.04

Indifferent  39.06  44.94

Not For     265.98 306.02
```

```
> testResult

	Pearson's Chi-squared test

data:  table
X-squared = 1.8992, df = 2, p-value = 0.3869
```

3C.

We retain the null hypothesis