Question 1

- Independent variable is condition of the task - either it's congruent or not.
- Dependent variable is the time it is needed to name the ink color.

Question 2

For the null-hypothesis we take that mean difference between incongruent and congruent test populations is less than or equal to 0, which is equivalent to the mean of incongruent population is less than or equal to mean of congruent population.
For the alternative hypothesis we take that mean difference between incongruent and congruent tests populations is greater than 0, which is equivalent to mean of congruent population is less than the mean of incongruent population.
In other words, for alternative hypothesis we take that it will take more time on average to pass incongruent tests than congruent one.

$$H_0: \mu_{incongruent} - \mu_{congruent} \leq 0$$
$$H_A: \mu_{incongruent} - \mu_{congruent} > 0$$

One tailed dependent t-test, because:

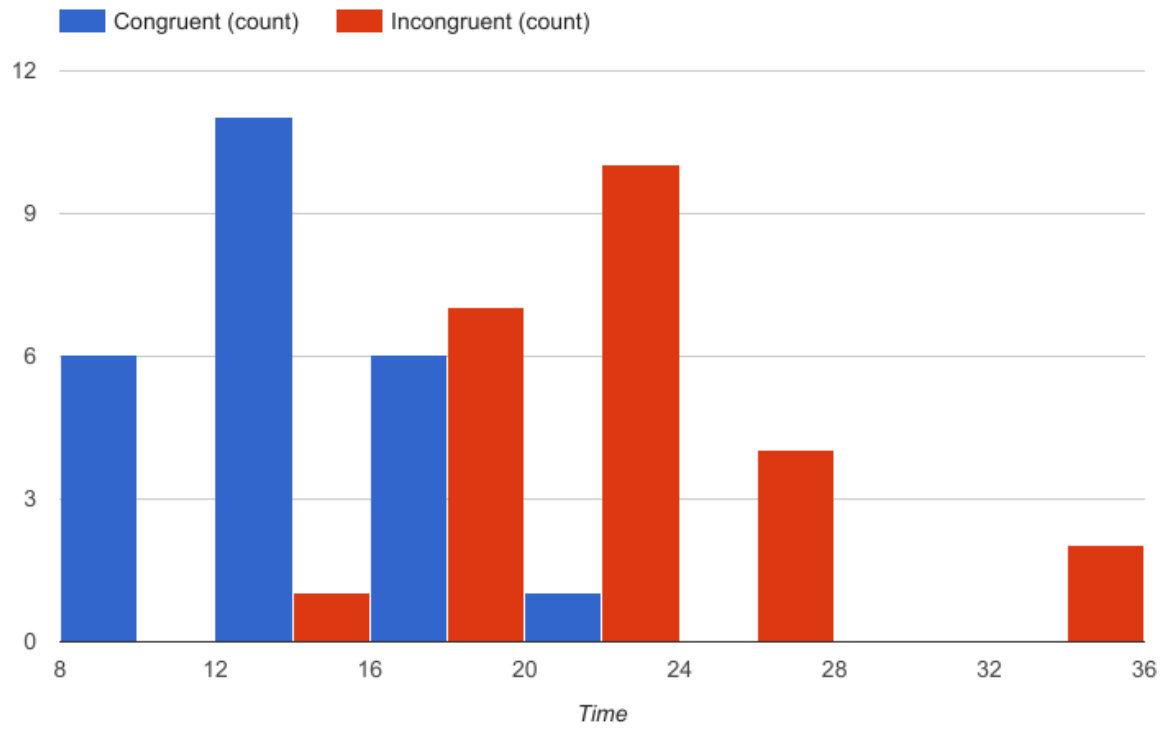
- We're dealing with sample data. The size of data is 24, which is obviously not the set of all people passed the Stroop test.
- We're talking about t-test and not a z-test because we don't know the parameters of the population.
- Each row in the sample is a time for the same person taking two tasks which means we're dealing with dependent sample – two condition repeated measurement.
- The idea of the test is to show how reaction time increases for incongruent task in comparison to congruent, so we're having one-tailed test, because we care about direction.

Question 3

The mean and standard deviation of each sample are listed in a table below.

	Congruent	Incongruent
Sample mean	14.05	22.02
Standard deviation	3.56	4.80

Question 4



On a visualization above you can find histograms for both samples. Both histograms are positively skewed. You can observe that the incongruent sample is shifted to the right comparing to the congruent one. This gives some hope that the null hypothesis will be rejected.

Question 5

$t_{critical} = 1.714$
$t(23) = 8.02, p < .05$, one-tailed mean difference.
We're rejecting null-hypothesis, which means we have statistical significant evidence that incongruent test takes longer than congruent one. This is expected result, because from personal experience it's harder to come up with correct answer for incongruent test.