

# Answers: Hypothesis Tests

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## Summary

Answers to questions relating to the guide on Hypothesis tests.

*These are the answers to [Questions: Hypothesis tests](#).*

**Please attempt the questions before reading these answers!**

## Defining hypotheses

1.  $H_0 : \mu = 350$   $H_1 : \mu < 350$
2.  $H_0 : p = 0.1$   $H_1 : p > 0.1$
3.  $H_0 : \mu_a = \mu_b$   $H_1 : \mu_a \neq \mu_b$
4.  $H_0 : \mu_r = \mu_x$   $H_1 : \mu_r > \mu_x$

## Significance levels

5.  $\alpha = 0.15$
6.  $\alpha = 0.01$

## Test selection

7. Paired  $t$ -test

## Critical values and conclusions

8. I reject  $H_0$  as the test statistic of 3.12 is greater than the critical value of 2.58. Therefore there is significant evidence to suggest the average daily sales of Boole Bars differ from 150.

9. I reject  $H_0$  as the test statistic of 2.01 is greater than the critical value of 1.645. Therefore there is significant evidence to suggest the proportion of customers who buy Lagrangian Lollipops exceeds 40%.
10. I do not reject  $H_0$  as the test statistic of 2.102 is between the critical values of 2.306 and  $-2.306$ . Therefore there is no significant evidence to suggest there is a difference in sweetness scores between the two recipes.

## **Version history and licensing**

v1.0: initial version created 12/24 by ect6 (as part of a University of St Andrews VIP project)

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