

(8 marks)

(a) A student randomly draws 50 tokens with replacement, and 6 of these tokens are red.

(2 marks)

- $$\hat{p} - 2.58 \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}.$$

$$\hat{p} = \frac{2.58^2}{n + 2.58^2} \text{ when } \hat{p} > 0.$$

(3 marks)

For example, if 5 of the 50 tokens randomly drawn were red, instead of 6 as in part (a), the 99% confidence interval for the proportion of red tokens in the bag would have been calculated as:

When the lower bound is less than or equal to zero, statisticians would use an alternative process to calculate the confidence interval, so that it does not contain any values for p that are less than or equal to zero.

- $$\hat{p} = \frac{2.58^2}{n + 2.58^2}$$

PLEASE TURN OVER