

Normal Distribution

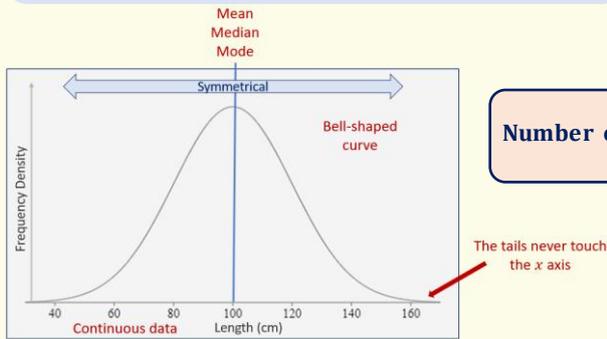
A **normal distribution** is a bell-shaped, symmetrical curve where the mean, median and mode are all equal. Data is continuous.

$$N(\mu, \sigma^2)$$

μ = mean (for population)

σ^2 = variance

σ = standard deviation (for population)



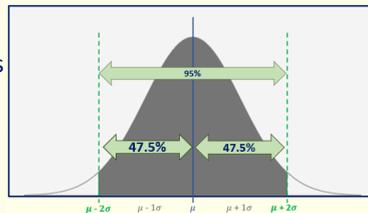
$$\text{Number of standard deviations from mean} = \frac{\text{value} - \text{mean}}{\text{standard deviation}}$$

$$\text{Variance} = \sqrt{\sigma^2}$$

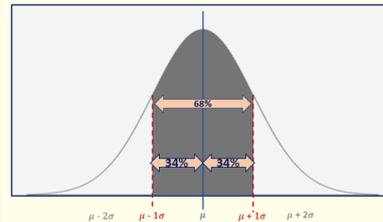
→ a measure of how spread out the data is

→ calculated as the standard deviation squared

95% of observations lie within ± 2 standard deviations of the mean



68% of observations lie within ± 1 standard deviation of the mean



A group of students completed the same puzzle individually.

The times taken to complete the puzzle by the students have a mean of 32 minutes and a standard deviation of 6 minutes. These times can be modelled by a normal distribution.

Nathaniel concludes that more than 95% of the students completed the puzzle between 26 and 44 minutes.

Use statistical calculations to assess Nathaniel's conclusion.

You might find it helpful to do a quick sketch of the normal distribution to picture what you are calculating.

(5 marks)