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# JC MATHEMATICS (H2) STUDY TIPS

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## SECRET TIPS OF SKETCHING THE BELL CURVE OF NORMAL DISTRIBUTION

PREPARED BY  
Mr Jackie Lee



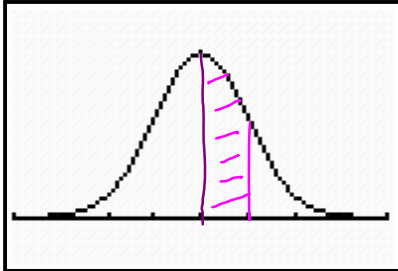
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JC\_H2Maths\_007



## 1. Properties of Normal Distribution

### • Introduction



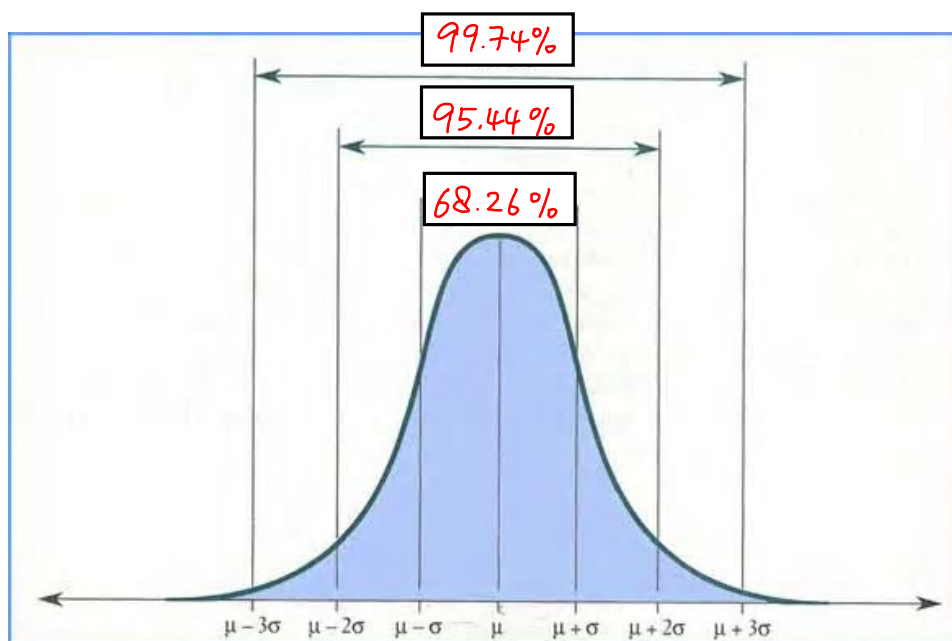
Normal distribution is commonly observed in our daily life, such as heights of citizens, test scores of a large public examination. Most of the data are located around the mean, and the number of data decreases progressively away from the mean towards both ends.

The curve shown above is the **probability density function** of a Normal distribution featuring the following properties.

- The curve is bell-shaped and continuous.
- It is symmetrical about the mean.
- The probability is given by the Area under the curve.
- The probability of a single value, i.e.  $P(X = a) = 0$ .
- Thus,  $P(X \leq a) = P(X < a)$  and  $P(X \geq a) = P(X > a)$ .

Normal distribution is denoted by  $N(\mu, \sigma^2)$ ,

where  $\mu$ : mean,  $\sigma^2$ : variance  $\Rightarrow$   $\sigma$ : standard deviation.





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## Explanation

The normal distribution is a balanced, bell-shaped curve centered around its middle average. Data spreads out from this center in equal steps called standard deviations, which you must mark clearly along the bottom horizontal line as the first, second, and third steps to show the scale.

Moving one, two, and three steps out from the center covers about sixty-eight, ninety-five, and nearly one hundred percent of all the data, though you do not need to memorize these exact numbers.

The key point is that the third step marks the ultimate boundary where almost all data is included, making any values past this line completely negligible.

When sketching this, make sure your curve drops flat against the bottom line right after your third marked step to show that almost nothing happens in the far outer edges.

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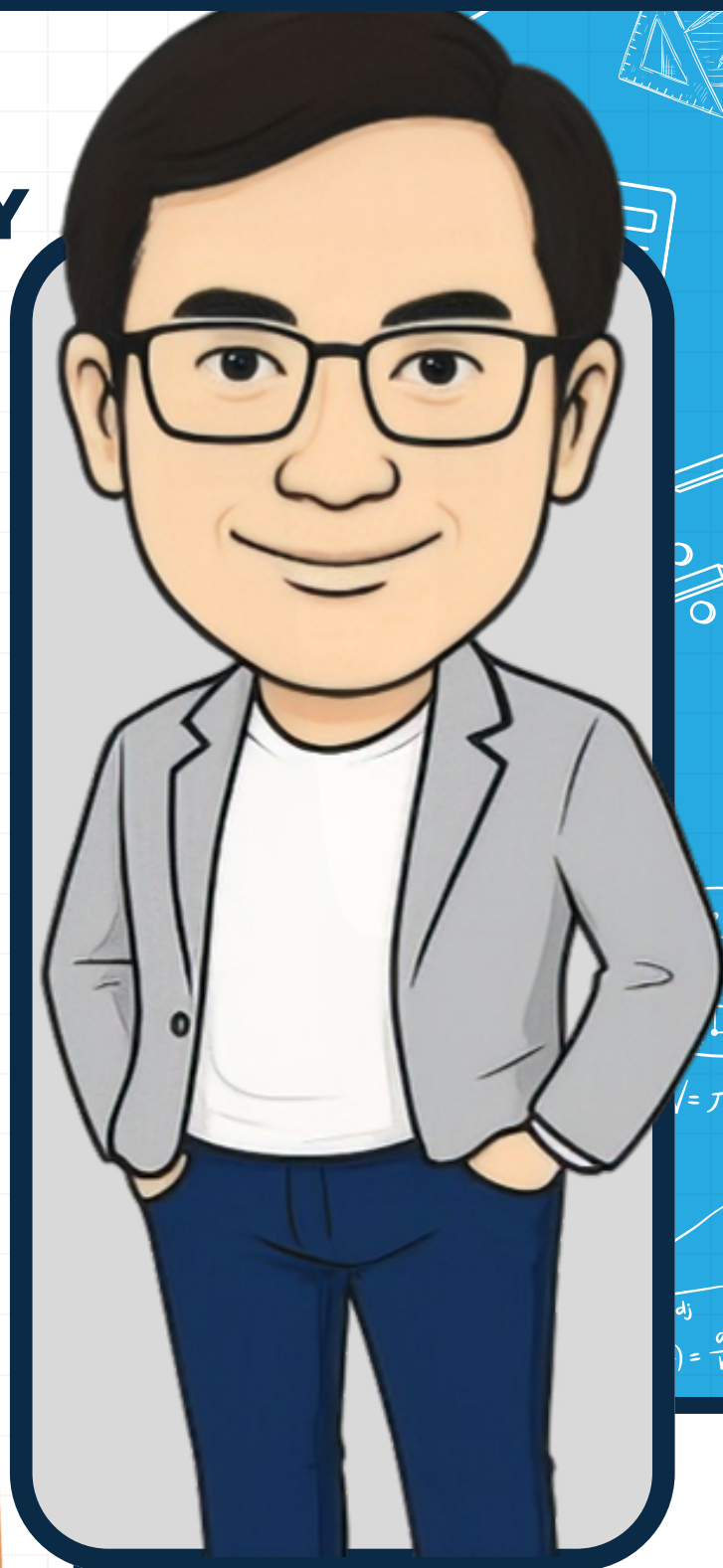
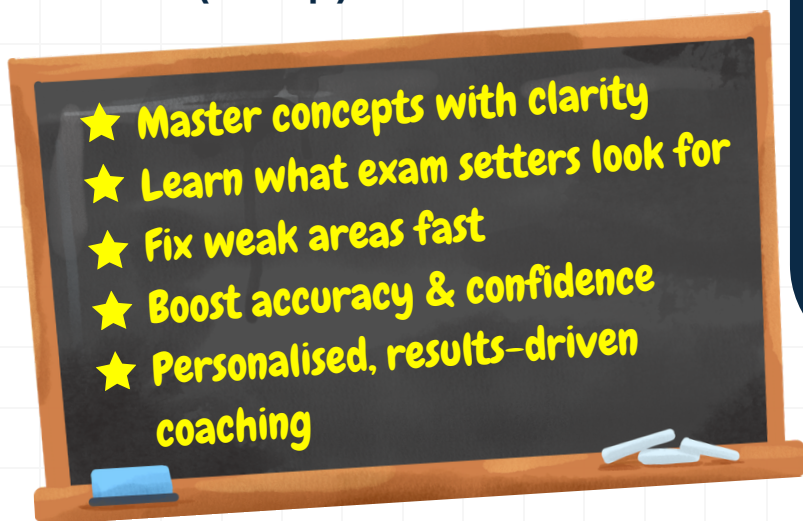
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- ✓ Former MOE Scholar
- ✓ Winner of International Mathematics Competitions
- ✓ PGDE Qualification (NIE) with **Distinction in Mathematics**
- ✓ Former **School Maths Teacher** in
  - Nan Hua High School
  - Raffles Institution
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