Calculus

International Baccalaureate · IB Diploma · Mathematics: Analysis and Approaches · HL · Vocabulary in context

Word	Example
secant /'si:kənt/	A **secant** cuts a circle at two points.
tangent /'tændʒənt/	Draw a **tangent** to the curve to find the gradient at one point.
derivative /dɪ'rɪvətɪv/	Use the **derivative** to find the curve's slope at this point.
normal /'nɔ:ml/	The **normal** is a line at 90° to the surface. 90°
chain rule /tʃeɪn ru:l/	Use the **chain rule** for a function inside another function.
product rule /'prɒdʌkt ru:l/	Use the **product rule** to differentiate x · sin x. x · sin x
quotient rule /'kwəʊʃənt ru:l/	Use the **quotient rule** to differentiate sin x / x. sin x / x
second derivative /'sekənd dɪ'rɪvətɪv/	The **second derivative** tells us how the gradient changes.
stationary point /'steɪʃənəri pɔɪnt/	The tangent is horizontal at a **stationary point**.
point of inflection /pɔɪnt ɒv ɪn'flekʃn/	At a **point of inflection**, the curve changes from bending one way to the other.
displacement /dɪ'spleɪsmənt/	After walking 3 km east, your **displacement** is 3 km east. 3 km 3 km
velocity /və'lɒsɪti/	The ball's **velocity** is 5 m/s to the left. 5 m/s

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integration /ˌɪntɪ'greɪʃn/	The NMR **integration** shows three hydrogens in this peak. NMR
indefinite integral /ɪn'defɪnət 'ɪntɪgrəl/	An **indefinite integral** always includes a constant of integration, + c. + c
definite integral /'defɪnət 'ɪntɪgrəl/	A **definite integral** has limits and gives a number, such as an area.
first principles /fɜ:st 'prɪnsɪplz/	Differentiating from **first principles** uses the gradient of a very short chord.
implicit differentiation /ɪm'plɪsɪt ˌdɪfəˌrenʃɪ'eɪʃn/	Use **implicit differentiation** when y is not on its own, as in $x^2 + y^2 = 25$. y x^2 $+ y^2 = 25$。
related rates /rɪ'leɪtɪd reɪts/	**Related rates** problems link how fast two quantities change.
partial fraction /'pɑ:ʃl 'frækʃn/	In **partial fraction** form, $1/(x(x + 1))$ is $1/x - 1/(x + 1)$. $1/(x(x + 1))$ $1/x - 1/(x + 1)$。
volume of revolution /'vɒlju:m ɒv ˌrevə'lu:ʃn/	Find the **volume of revolution** by rotating this region about an axis.
differential equation /ˌdɪfə'renʃl ɪ'kweɪʒn/	A **differential equation** links a quantity and its rate of change.
Euler's method /'ɔɪlə 'meθəd/	**Euler's method** uses many small straight steps to follow a curve.
separation of variables /ˌsepə'reɪʃn ɒv 'veərɪəblz/	Use **separation of variables**: put all y's on one side and x's on the other. y x

Word	Example
∗ **integrating factor** /ˈɪntɪgreɪtɪŋ ˈfæktə/	Multiply by the **integrating factor** to solve the equation.
$\times^2$ **Maclaurin series** /məˈklɔːrɪn ˈsɪəriːz/	The **Maclaurin series** for e^x is $1 + x + x^2/2! + \ldots$. e^x $1 + x + x^2/2! + \ldots$

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