Calculus

International Baccalaureate · IB Diploma · Mathematics: Applications and Interpretation · 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.
increasing /ɪn'kri:sɪŋ/	A sequence is **increasing** if each term is bigger than the last.
decreasing /'di:kri:sɪŋ/	A sequence is **decreasing** if each term is smaller than the last.
normal /'nɔ:ml/	The **normal** is a line at 90° to the surface. 90°
stationary point /'steɪʃənəri pɔɪnt/	The tangent is horizontal at a **stationary point**.
local maximum /'ləʊkl 'mæksɪməm/	The curve has a **local maximum** at the top of the hill.
local minimum /'ləʊkl 'mɪnɪməm/	The curve has a **local minimum** at the bottom of the valley.
integration /ˌɪntɪ'greɪʃn/	The NMR **integration** shows three hydrogens in this peak. NMR
constant of integration /'kɒnstənt ɒv ˌɪntɪ'greɪʃn/	The **constant of integration** c is there because every curve $y = x^2 + c$ has the same gradient 2x. $y = x^2 + c$ 2x c

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definite integral /'defɪnət 'ɪntɪgrəl/	A **definite integral** has limits and gives a number, such as an area.
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 $x \cdot \sin x$. $x \cdot \sin x$
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.
point of inflection /pɔɪnt ɒv ɪn'flekʃn/	At a **point of inflection**, the curve changes from bending one way to the other.
volume of revolution /'vɒlju:m ɒv ˌrevə'lu:ʃn/	Find the **volume of revolution** by rotating this region about an axis.
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
acceleration /ək,selə'reɪʃn/	The car speeds up quickly, so its **acceleration** is large.
differential equation /ˌdɪfə'renʃl ɪ'kweɪʒn/	A **differential equation** links a quantity and its rate of change.
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
slope field /sləʊp fi:ld/	A **slope field** shows small line segments with the slope at each point.

Word	Example
Euler's method /ˈɔɪləz ˈmeθəd/	**Euler's method** uses many small straight steps to follow a curve.
coupled system	A predator–prey model is a **coupled system**: each population affects the other.
phase portrait	A **phase portrait** shows how x and y change together. x y
• **equilibrium point**	At an **equilibrium point**, nothing changes.
saddle point	Near a **saddle point**, paths come in one way and go out another.

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