Differentiation: Composite, Implicit, and Inverse Functions

AP Calculus AB · Vocabulary in context

Word	Example
chain rule /tʃeɪn ruːl/	Use the **chain rule** for a function inside another function.
composite function /ˈkɒmpəzɪt ˈfʌŋkʃn/	A **composite function** fg(x) means f(g(x)): apply g first. fg(x) f(g(x)) g
Leibniz notation	In **Leibniz notation**, the chain rule is dy/dx = dy/du · du/dx. dy/dx = dy/du · du/dx。
outer function	In $\sin(x^2)$, sine is the **outer function**. $\sin(x^2)$
inner function	In $\sin(x^2)$, x^2 is the **inner function**. $\sin(x^2)$ x^2
implicit differentiation /ɪmˈplɪsɪt ˌdɪfəˌrenʃiˈeɪʃn/	Use **implicit differentiation** when y is not on its own, as in $x^2 + y^2 = 25$. y x^2 + $y^2 = 25$。
tangent line /ˈtændʒənt laɪn/	The **tangent line** touches the curve at one point and has the same slope there.
perpendicular /ˌpɜːpənˈdɪkjʊlə/	The wall is **perpendicular** to the floor.
radius /ˈreɪdɪəs/	The **radius** of a circle is the distance from the centre to the edge.
inverse function /ɪnˈvɜːs ˈfʌŋkʃn/	The **inverse function** undoes the original function.
reciprocal /rɪˈsɪprəkl/	The **reciprocal** of 4 is 1/4. 4 1/4

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Word	Example
inverse trigonometric function	arcsin x is an **inverse trigonometric function**. arcsin x
product rule /ˈprɒdʌkt ruːl/	Use the **product rule** to differentiate x · sin x. x · sin x
quotient rule /ˈkwəʊʃənt ruːl/	Use the **quotient rule** to differentiate sin x / x. sin x / x
laws of logarithms /lɔːz ɒv ˈlɒgərɪθəmz/	The **laws of logarithms** say ln(ab) = ln a + ln b. ln(ab) = ln a + ln b
second derivative /ˈsekənd dɪˈrɪvətɪv/	The **second derivative** tells us how the gradient changes.
higher-order derivative	The second derivative is a **higher-order derivative**.
concavity /kənˈkævɪti/	The second derivative tells you the **concavity**: which way the curve bends.
acceleration /əkˌseləˈreɪʃn/	The car speeds up quickly, so its **acceleration** is large.