

連鎖律

(1) 設 $y = (\boxed{2x+1})^6$, 則 $\frac{dy}{dx} = ?$

Sol. $\frac{dy}{dx} = 6(2x+1)^5 \cdot 2 = 12(2x+1)^5$

(2) 設 $y = \frac{1}{(5x+3)^4}$, 則 $\frac{dy}{dx} = ?$ $y = (5x+3)^{-4}$

Sol. $\frac{dy}{dx} = -4(5x+3)^{-5} \cdot 5 = -20(5x+3)^{-5}$

(3) 設 $y = \sqrt{3x^2+5}$, 則 $\frac{dy}{dx} = ?$ $y = (3x^2+5)^{\frac{1}{2}}$

Sol. $\frac{dy}{dx} = \frac{1}{2}(3x^2+5)^{-\frac{1}{2}} \cdot (6x) = 3x(3x^2+5)^{-\frac{1}{2}}$
 $= 3x \frac{1}{\sqrt{3x^2+5}}$

(4) 設 $y = \sin(\boxed{x^2+2x+3})$, 則 $\frac{dy}{dx} = ?$ $(\sin x)' = \cos x$

Sol. $\frac{dy}{dx} = [\cos(x^2+2x+3)](2x+2)$

$= (2x+2) \cos(x^2+2x+3)$