Al-Rasheed University Collage

Dept. of Medical Instrument Tech. Eng.

First Class / Mathematics

امثلة عن المشتقات

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$$\frac{d}{dx}(c)=0 \quad (c \text{ is a constant})$$

$$\frac{d}{dx}\left(x^n\right)=nx^{n-1} \quad (n \text{ is a real number})$$

$$\frac{d}{dx}(cf(x))=c\frac{d}{dx}(f(x)) \quad (c \text{ is a constant})$$

$$\frac{d}{dx}\left[f(x)\pm g(x)\right]=\frac{d}{dx}[f(x)]\pm\frac{d}{dx}[g(x)]$$

$$\frac{d}{dx}\left[f(x)\cdot g(x)\right]=\frac{d}{dx}[f(x)]g(x)+\frac{d}{dx}[g(x)]f(x)$$

$$\frac{d}{dx}\left[\frac{f(x)}{g(x)}\right]=\frac{g(x)\frac{d}{dx}[f(x)]-f(x)\frac{d}{dx}[g(x)]}{[g(x)]^2}$$

$$\frac{d}{dx}e^u = e^u \frac{du}{dx}$$

$$\frac{d}{dx}\left(a^u\right) = a^u \ln a \frac{du}{dx}$$

$$\frac{d}{dx}\ln u = \frac{1}{u}\frac{du}{dx}$$

$$\frac{d}{dx}\log_a u = \frac{1}{u \ln a}\frac{du}{dx}$$

$$\frac{d}{dx}(\sin x) = \cos x \qquad \frac{d}{dx}(\csc x) = -\csc x \cot x$$

$$\frac{d}{dx}(\cos x) = -\sin x \qquad \frac{d}{dx}(\sec x) = \sec x \tan x$$

$$\frac{d}{dx}(\tan x) = \sec^2 x \qquad \frac{d}{dx}(\cot x) = -\csc^2 x$$

$$\frac{d}{dx}(\sinh x) = \cosh x \qquad \frac{d}{dx}(\operatorname{csch} x) = -\operatorname{csch} x \coth x$$

$$\frac{d}{dx}(\cosh x) = \sinh x \qquad \frac{d}{dx}(\operatorname{sech} x) = -\operatorname{sech} x \tanh x$$

$$\frac{d}{dx}(\tanh x) = \operatorname{sech}^2 x \qquad \frac{d}{dx}(\coth x) - \operatorname{csch}^2 x$$

$f(x)=x^{0.5}+0.5x+0.5$

$$f`(x) = 0.5x^{0.5-1} + 0.5*1*x^{(1-1)} + 0$$

$$= 0.5x^{-0.5} + 0.5$$

$$= \frac{1}{2x^{0.5}} + 0.5$$

$$= \frac{1}{2\sqrt{x}} + 0.5$$

$$\frac{d}{dx}\left[f(x) \pm g(x) \right] = \frac{d}{dx}\left[f(x) \right] \pm \frac{d}{dx}\left[g(x) \right]$$

$$\frac{d}{dx}\left(x^n \right) = nx^{n-1} \quad \left(n \text{ is a real number} \right)$$

$$\frac{d}{dx}\left(c \right) = 0 \quad \left(c \text{ is a constant} \right)$$

$$f(x)=\frac{cos2x}{2x}$$

$$\frac{d}{dx}\left[\frac{f(x)}{g(x)}\right]=\frac{g(x)\frac{d}{dx}[f(x)]-f(x)\frac{d}{dx}[g(x)]}{[g(x)]^2}$$

$$f`(x)=\frac{2x\big((-sin2x)*2\big)-[(cos2x)*2]}{(2x)^2}$$

$$\frac{d}{dx}(\cos x)=-\sin x$$

$$f`(x)=\frac{-4xsin2x-2cos2x}{4x^2}$$

$$f`(x)=\frac{2(-2xsin2x-cos2x)}{4x^2}$$

$$f`(x)=\frac{(2xsin2x-cos2x)}{2x^2}$$

$$\frac{d}{dx}\left[f(x)\cdot g(x)\right]=\frac{d}{dx}\left[f(x)\right]g(x)+\frac{d}{dx}\left[g(x)\right]f(x)$$

$$f(x)=(e^{2x}+5)(ln2x+3)$$

$$\frac{d}{dx}\ln u=\frac{1}{u}\frac{du}{dx}$$

$$\frac{d}{dx}e^{u}=e^{u}\frac{du}{dx}$$

مشتقة دالتين مضروبة= (مشتقة الأول *الثاني)+(مشتقة الثاني *الأول)

$$f`(x)=(e^{2x}*2+0)(ln2x+3)\quad+\left(\frac{1}{2x}*2+0\right)(e^{2x}+5)$$

$$=(ln2x+3)*(2e^{2x})+(e^{2x}+5)*\left(\frac{1}{x}\right)$$

$$=\left(2e^{2x}ln2x+6\,e^{2x}\right)+\left(\frac{e^{2x}}{x}+\frac{5}{x}\right)$$

$$f(x)=\log_{10} 5x$$

$$\frac{d}{dx}\log_a u = \frac{1}{u \ln a}\frac{du}{dx}$$

$$f`(x) = \frac{1}{5x * ln10} * 5$$

$$= \frac{1}{x * ln10}$$

$$\frac{d}{dx}\left[f(x)\cdot g(x)\right]=\frac{d}{dx}\left[f(x)\right]g(x)+\frac{d}{dx}\left[g(x)\right]f(x)$$

$$f(x)=\cos 3x.\sec 2x+\sin x^2.\cot 3x$$

$$f`(x)=\{[-\sin 3x*(3)]*\sec 2x+[\sec 2x*\tan 2x*(2)]*\cos 3x\}$$

$$+\{[\cos x^2*(2x)]*\cot 3x+[-\csc^2 3x*(3)]*\sin x^2\}$$

$$=\{-3\sin 3x*\sec 2x+2\sec 2x*\tan 2x\cos 3x\}$$

$$+\{2x\cos x^2*\cot 3x-3\csc 3x*\sin x^2\}$$

$$\frac{d}{dx}(\cos x)=-\sin x$$

$$\frac{d}{dx}(\sec x)=\sec x\tan x$$

$$\frac{d}{dx}(\sin x)=\cos x$$

$$\frac{d}{dx}(\cot x)=-\csc^2 x$$