$(\sin x)' = \cos x$

$(\ln x)' = \frac{1}{x}$ ... $x > 0$ $\quad (-\infty, 0) \cup (0, \infty)$

$(x^n)' = n\, x^{n-1}$ $\quad x \in \mathbb{R}$

$(x^2)' = 2x^{2-1} = 2x$ $\quad x \in \mathbb{R}$

$\left(x^{\frac{1}{2}}\right)' = \frac{1}{2} x^{\frac{1}{2}-1} = \frac{1}{2} x^{-\frac{1}{2}}$ $\quad x > 0$

$x \geq 0$ $\quad (\sqrt{x})' = \left(x^{\frac{1}{2}}\right)' = \frac{1}{2} x^{-\frac{1}{2}} = \frac{1}{2\sqrt{x}}$

$(x^{-3})' = -3x^{-4} = \frac{-3}{x^4}$

$\left(\frac{1}{x^3}\right)' = \left(x^{-3}\right)' = \frac{-3}{x^4}$

$(x^2 + \cos x)' = 2x + (-\sin x)$

$(5 \cdot \arctan x)' = 5 \cdot \frac{1}{1+x^2}$

$(5 + \arctan x)' = 0 + \frac{1}{1+x^2}$

$$\left(\frac{\cos x}{\pi}\right) = \frac{1}{\pi} \cdot \cos x$$

$$(f \cdot g)' = f'g + fg'$$

$$(x^3 \cdot \cos x)' = (x^3)' \cdot \cos x + x^3 (\cos x)' =$$

f g

$$= 3x^2 \cdot \cos x + x^3 \cdot (-\sin x)$$

~~*~~ $\cos x$ is cont. on $\mathbb{R}$ ☺

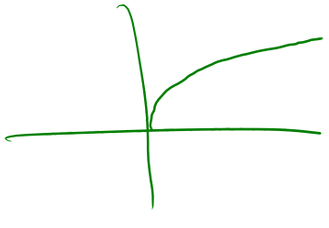
$$\left(\frac{f}{g}\right)' = \frac{f' g - f g'}{g^2}$$

$$\left(\frac{\ln x}{\sqrt{x}}\right)' = \frac{(\ln x)' \sqrt{x} - \ln x \cdot (\sqrt{x})'}{(\sqrt{x})^2} =$$

$\sqrt{x}$ cont.

$x \geq 0$ ✓

$$= \frac{\frac{1}{x} \cdot \sqrt{x} - \ln x \cdot \frac{1}{2} \cdot \frac{1}{\sqrt{x}}}{(\sqrt{x})^2} \qquad x > 0$$



$$((fg)h)' = (fg)' h + fg h' = (f'g + fg')h + fgh'$$

$(x^2 e^x) \sin x$ — 1st, 2nd

$(f'g) + (fg')$

$$(\sin(x^2))' = (\cos x^2) \cdot (x^2)' = (\cos x^2) \cdot 2x$$

$$(\sin(y))' = \cos y$$

$$y = x^2$$

$$g(x) = x^2 \qquad (x^2)' = 2x$$

$$(e^{\tan\sqrt{x}})' = (e^{\tan\sqrt{x}}) \cdot (\tan\sqrt{x})'$$

e^y

$\tan z$

$\sqrt{x}$

$$\frac{1}{\cos^2\sqrt{x}} \cdot (\sqrt{x})'$$

$$\frac{1}{2\sqrt{x}}$$

cont

Gr

cont.

$$= e^{\tan\sqrt{x}} \cdot \frac{1}{\cos^2\sqrt{x}} \cdot \frac{1}{2\sqrt{x}}$$

$\sqrt{x} \in (-\frac{\pi}{2}, \frac{\pi}{2}) + k\pi$

$$(\ln^3 x^2)' = \left((\ln x^2)^3\right)' = 3(\ln x^2)^2 \cdot (\ln x^2)'$$

$\ln x^2$ $(-\infty, 0) \cup (0, \infty)$

$= 2 \ln x$

$(0, \infty)$

y^3

$\hookrightarrow \frac{1}{x^2} \cdot (x^2)'$

$\hookrightarrow 2x$

$$= 3(\ln x^2)^2 \cdot \frac{1}{x^2} \cdot 2x$$

$$= 3 \frac{(\ln^2 x^2)}{x}$$

☺

$$\left(\ln\left[\ln(x-3)\right]\right)' = \frac{1}{\ln(x-3)} \cdot \left(\ln(x-3)\right)'$$

$$\frac{1}{x-3} \cdot (x-3)'$$

$$1 + 0$$

$$= \frac{1}{\ln(x-3)} \cdot \frac{1}{x-3} \cdot 1$$

$$\Big(\sin(\underbrace{\sin(\sin x)}_{✿})\Big)' = \cos ✿ \cdot (✿)' \quad :)$$

$$\sin(\cos x)$$

$$x^{\sin x}$$

$$e^{\sin x \cdot \ln x}$$

$$a^b = e^{b \ln a}$$