DPP - 2

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1. $\frac{d}{dx}(u+v-w)$

$\frac{du}{dx}+\frac{dv}{dx}-\frac{d\omega}{dx}$

2. $\frac{d}{dx}\left(\frac{u}{v}\right)$

$=\frac{v\frac{du}{dx}-u\frac{dv}{dx}}{v^2}$

$=\frac{1}{v}\left(\frac{du}{dx}-\frac{u}{v}\frac{dv}{dx}\right)$

3. $\frac{d}{dx}(u^n)$

$=nu^{n-1}\frac{du}{dx}$

4. $\frac{d}{dx}(x^5+x^7+x^9)$

$=5x^4+7x^6+9x^8$

5. $\frac{d}{dx}(x\log_e x-x)$

$=x\frac{d}{dx}\log_e x+\log_e x\frac{dx}{dx}-\frac{dx}{dx}$

$=1+\log_e x-1$

$=\log_e x$

6. $\frac{d}{dx}(x\log_e x)$

$=x\frac{d}{dx}\log_e x+\log_e x\frac{dx}{dx}$

$=x\times\frac{1}{x}+\log_e x\cdot 1$

$=1+\log_e x$

7. $\frac{d}{dx}\left(\frac{1}{x}+\tan x+x^2+\log x\right)$

$=-\frac{1}{x^2}+\sec^2 x+2x+\frac{1}{x}$

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8. $Y = \sin x + x^4$

$\frac{dy}{dx} = +\cos x + 4x^3$

$\frac{d^2y}{dx^2} = -\sin x + 12x^2$

9. $Y = e^x \sin x$

$\frac{dy}{dx} = e^x \cos x + e^x \sin x$

$\frac{d^2y}{dx^2} = e^x(-\sin x) + e^x \cos x + e^x \cos x + \sin x \cdot e^x$

$2e^x \cos x$

10. $\frac{d}{dx}(x^4 - 2\sin x + 3\cos x)$

$= 4x^3 - 2\cos x - 3\sin x$

11. $xy = c^2$

$y = \frac{c^2}{x}$

$\frac{dy}{dx} = -\frac{1c^2}{x^2} = \frac{-c^2}{x^2}$

$c^2 = xy$

$\frac{dy}{dx} = \frac{xy}{x^2} = \frac{-y}{x}$

12. $x = at^2$ $Y = 2at$

$\frac{dx}{dt} = 2at$ $\frac{dy}{dt} = 2a$

$\frac{dY}{dx} = \frac{2a}{2at} = \frac{1}{t}$

13. $Y = \sin^3 x - 3\sec^2 x$

$\frac{dy}{dx} = 3\sin^2 x \cdot \cos x - 6\sec x \cdot \sec x \tan x$

$\frac{dy}{dx} = 3\sin^2 x \cos x - 6\sec^2 x \tan x$

$x = \frac{\pi}{3}$ $\frac{dy}{dx} = \frac{9-96\sqrt{3}}{4}$

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14. $Y = x^3 + 2x + 1$

$$\frac{dy}{dx} = 3x^2 + 2$$

$$x = 1 \frac{dy}{dx} = 5$$