$$\frac{dy}{dx} = (2x-2)e^u = (2x-2)e^{x^2-2x} \quad 6$$

Section 6C

$$\frac{d}{dx}\left[\sin(x^2)\right] = 2x\cos(x^2)$$

$$\frac{d}{dx}\left[\sin(x^5)\right] = 5x^4\cos(x^5)$$

$$\frac{d}{dx}\left[\sin(e^x)\right] = e^x\cos(e^x)$$

$$\frac{d}{dx}\left[\sin(u)\right] = \frac{dy}{dx}\cos(u)$$

$$\frac{d}{dx}(e^u) = \frac{dy}{dx}e^u$$

Find $\frac{d}{dx}\left[(x^3+2x)^5\right] = 5(x^3+2x)^4(3x^2+2)$

$$= (15x^2+10)(x^3+2x)^4$$

$$\frac{d}{dx}\left[\tan(x^7-5x)\right] = \sec^2(x^7-5x).(7x^6-5)$$

$$= (7x^6-5)\sec^2(x^7-5x)$$

$$\frac{d}{dx}\left[\sinh(x^2+3x)\right] = (2x+3)\cosh(x^2+3x)$$

$$\frac{d}{dx}\left[\sin(x^3+2x)\right] = (3x^2+2)\cos(x^3+2x)$$

$$\frac{d}{dx}\left[e^{x^2+\cos(x)}\right] = (2x - \sin(x))\, e^{x^2+\cos(x)}$$

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$$\frac{d}{dx}\left[\ln(\cos(x))\right] = \frac{1}{\cos(x)} \cdot (-\sin(x))$$

$$= -\tan(x)$$

$C = 0.2 \times 10^{-6}$, $v = 1 - e^{-t/(2\times 10^{-6})}$

$$\boxed{i = C\frac{dv}{dt}}$$

Sol^n:

$$\frac{dv}{dt} = \frac{d}{dt}\left[1 - e^{-t/(2\times 10^{-6})}\right]$$

$$= 0 - -\frac{1}{2\times 10^{-6}} e^{-t/(2\times 10^{-6})}$$

$$\boxed{(e^{kt})' = ke^{kt}}$$

$$= \frac{1}{2\times 10^{-6}} e^{-t/(2\times 10^{-6})}$$

$$i = \frac{0.2 \times \cancel{10^{-6}}}{2 \times \cancel{10^{-6}}} e^{-t/(2\times 10^{-6})}$$

$$= 0.1\, e^{-t/(2\times 10^{-6})}$$