19/ENG04/024 [TAI 104

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Electrical Electronics

~~1) $y = 2x^2 + 3$~~

2) $y = \frac{2x}{x^2 - 5}$

$m = \frac{dy}{dx}$

$\Rightarrow$ let $u = 2x$ $\quad v = x^2 - 5$

$du = 2$ $\quad dv = 2x$

$\frac{dy}{dx} = 2x(2x) + 2(x^2 - 5)$

$= 4x^2 + 2x^2 - 10$

$= 6x^2 - 10$ ~~at point (3, 4)~~

at point (x, y) $(2, 4)$

$m = 6(2)^2 - 10$

$= 24 - 10 = 14$

3) $z = 2x^3 \ln y$

$\frac{dz}{dy} z = 2x^3 \times 1/y$

$= \frac{2x^3}{y}$

4) $\int_0^2 x(2x^2 + 1)^{1/2}$

$\Rightarrow \int_0^2 x\sqrt{2x^2 + 1}$

Let $u = \sqrt{2x^2 + 1}$

1) $y = \frac{2x^2+3}{\ln 2x}$

$u = 2x^2+3 \qquad v = \ln 2x$

$\frac{du}{dx} = 4x \qquad \frac{dv}{dx} = 1/x$

$\frac{dy}{dx} = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2} = \frac{\ln 2x(4x) - \frac{1}{x}(2x^2+3)}{(\ln 2x)^2}$

$= \frac{x^2\ln(16x^4) - 2x^2 - 3}{x\ln^2(2x)}$

At $x = 2.5$

$\Rightarrow \frac{(2.5)\ln(16(2.5)^4) - 2(2.5) - 3}{2.5\ln^2(2(2.5))}$

$= 3.82$ At $x = 2.5$

$= \frac{\ln 2(2.5)(4(2.5) - 2(2.5) - 3}{(\ln 2(2.5))^2}$

$= 1.154$