

$$\begin{aligned} 1) \quad f(x) &= -\frac{x^2}{10} \\ f'(x) &= -\frac{x}{5} \\ dy &= f'(x)dx \\ &= -\frac{x dx}{5} = -\frac{x \Delta x}{5} \quad -\frac{(-3)(1)}{5} = \frac{3}{5} \end{aligned}$$

$$\begin{aligned} \Delta y &= f(x + \Delta x) - f(x) \\ &= f(-3 + 1) - f(-3) \\ &= f(-2) - f(-3) \\ &= -\frac{4}{10} + \frac{9}{10} = \frac{1}{2} \end{aligned}$$

$$2a) \log_2\left(\frac{1}{32}\right) = \log_2 2^{-5} = -5$$

$$b) 3e^{-2x} = 5$$

$$\ln 3 + \ln e^{-2x} = \ln 5$$

$$\ln 3 + -2x \ln e = \ln 5$$

$$\ln 3 - 2x = \ln 5$$

$$-2x = \ln 5 - \ln 3$$

$$-2x = \ln \frac{5}{3}$$

$$x = \frac{\ln \frac{5}{3}}{-2}$$

$$3) \quad X^2 = 3y^2 + \cos x$$

$$2x = 6y \frac{dy}{dx} + (-\sin x)$$

$$\frac{2x + \sin x}{6y} = \frac{dy}{dx}$$

$$4) \quad X^3 - Y^3 = 6xy$$

$$3x^2 - 3y^2 \frac{dy}{dx} = 6x \frac{dy}{dx} + 6y$$

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

$$5) \quad y^2 - x + 1 = 0$$

$m_{tan} (1,3)$

$$2y \frac{dy}{dx} - 1 = 0$$

$$\frac{dy}{dx} = \frac{1}{2y}$$

$$\left. \frac{dy}{dx} \right|_{y=3} = \frac{1}{6}$$