

Thursday, October 20, 2016

AP Group Assignment

Chapter 4 Test Tuesday!!!



③ $x^2 + y^2 = 25$ Find y'' @ $(4, 3)$

$$2x + 2y \frac{dy}{dx} = 0$$

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

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

$$\frac{d^2y}{dx^2} = \frac{y(-1) - (-x)\frac{dy}{dx}}{y^2}$$

$$= \frac{-y + x\left(\frac{-x}{y}\right)}{y^2}$$

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

$$\frac{d^2y}{dx^2} = \frac{-(3)^2 - (4)^2}{(3)^3} = \frac{-9 - 16}{27} = \frac{-25}{27} \quad \boxed{A}$$

⑤ $f(x) = \frac{e^{2x}}{2x}$ find $f'(x)$

$$f'(x) = \frac{2x \cdot e^{2x} \cdot 2 - e^{2x} \cdot 2}{(2x)^2}$$

$$= \frac{4xe^{2x} - 2e^{2x}}{4x^2}$$

$$= \frac{2xe^{2x} - e^{2x}}{2x^2} = \frac{e^{2x}(2x-1)}{2x^2} \quad \boxed{C}$$

Q.R.

⑨ $f(x) = x^3 + x$ $g(x) = f^{-1}(x)$ $g(2) = 1$
Find $g'(2)$

$$f'(x) = 3x^2 + 1$$

$$f'(1) = 3(1)^2 + 1 = 4$$

$$g'(2) = \boxed{\frac{1}{4}} \quad \boxed{D}$$

point on g : $(2, 1)$

point on f : $(1, 2)$

$$g'(2) = \boxed{\frac{1}{4}} \quad \boxed{D}$$

$$(11) \quad f(x) = x^2 + 2x \quad \frac{d}{dx} f(\ln x) =$$

$$f(\ln x) = (\ln x)^2 + 2 \ln x$$

$$f'(\ln x) = 2 \ln x \cdot \frac{1}{x} + 2 \cdot \frac{1}{x}$$

$$= \frac{2 \ln x}{x} + \frac{2}{x} = \frac{2 \ln x + 2}{x} \quad \boxed{B}$$

$$(12) \quad \sin(xy) = x \quad \text{find } \frac{dy}{dx}$$

$$\cos(xy) \cdot \left[x \frac{dy}{dx} + 1 \cdot y \right] = 1$$

$$\left[x \frac{dy}{dx} + y \right] = \frac{1}{\cos(xy)}$$

$$x \frac{dy}{dx} = \frac{1}{\cos(xy)} - y$$

$$\frac{dy}{dx} = \frac{\frac{1}{\cos(xy)} - y}{x} \cdot \frac{\cos(xy)}{\cos(xy)} = \frac{1 - y \cos(xy)}{x \cos(xy)} \quad \boxed{C}$$