Calculus 2nd Sec.

2nd term

Final Revision

If $z = \frac{1}{2}y^2 + y - 2$, $y = x^2 + x + 1$, then $\frac{dz}{dx} = \dots\dots\dots$ at $x = \frac{-1}{2}$

(a) zero. (b) 1 (c) $\frac{1}{2}$ (d) $\frac{-1}{2}$

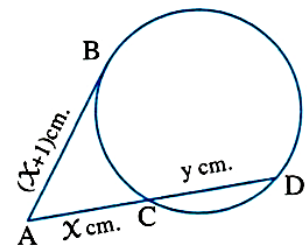
The tangent to the curve f is perpendicular to the x-axis if ....

(a) $\frac{dy}{dx} = 0$ (b) $\frac{dy}{dx} = 1$ (c) $\frac{dx}{dy} = 0$ (d) $\frac{dx}{dy} = \frac{1}{2}$

In the opposite figure :

If $\overline{AB}$ is a tangent segment to a circle

, then $\frac{dy}{dx} =$ …………… at $x = 5$



(a) -5

(b) $-\frac{1}{5}$

(c) $\frac{-1}{25}$

(d) -25

$\int \sqrt[3]{x^2}\, dx = \text{..............} + C$

(a) $\frac{5}{3} x \sqrt[3]{x^2}$ (b) $\frac{3}{5} x \sqrt[3]{x^2}$ (c) $\frac{3}{5} x \sqrt[3]{x}$ (d) $\frac{3}{5} \sqrt[3]{x^2}$

In which of the following functions , the average rate of change when X changes from X_1 to $(X_1 + h)$ is a constant value ?

(a) $f(X) = 4X^2 + 10$

(b) $f(X) = 2X - 3$

(c) $f(X) = \frac{1}{2}X^3 + 7X$

(d) $f(X) = \frac{1}{X}$

If $f(X) = (10X + 1)^{50}$, then $\acute{f}$ (zero) = ...

(a) 1 (b) zero (c) 500 (d) 600

If $y = 3^7$, then $\frac{dy}{dx} = \ldots\ldots\ldots\ldots\ldots$

(a) 7×3^6 (b) $\frac{3^8}{8}$ (c) $\cos\left(\frac{\pi}{2}\right)$ (d) $\sin\frac{\pi}{6}$

The point on the curve $y = x^2 - 8x + 1$ at which the tangent to the curve is parallel to the straight line : $4x + y + 2 = 0$ is ....

(a) $(-2 , 2)$ (b) $(2 , 12)$ (c) $(2 , 2)$ (d) $(2 , -11)$

If $y = \sqrt{g(x)}$ and $\grave{g}(2) = 4$, $g(2) = 9$, then $\frac{dy}{dx} =$ .... at $x = 2$

(a) $\frac{4}{3}$ (b) $\frac{2}{9}$ (c) $\frac{1}{6}$ (d) $\frac{2}{3}$

$\int \frac{2x^2+3}{x^2}\,dx = \dots\dots\dots\dots + C$

(a) $2x-3$ (b) $2x-\frac{3}{x}$ (c) $\frac{1}{2}x^2-\frac{3}{x}$ (d) x^2-3x

A square - shaped lamina extended gradually preserving its shape , then rate of change of its area with respect to its side length when its side length 5 cm. equals ....

(a) 5 (b) 10 (c) 25 (d) 100

If $y = z^2 + z$, $z = 2x^2$, then $\frac{dy}{dx} - \frac{dz}{dx} =$ ....

(a) $16x^3 + 4x$ (b) $16x^3 - 4x$ (c) $16x^3$ (d) $4x$

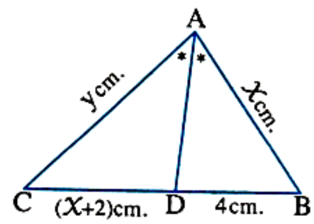
If $y = (2x + 5)(3x + 5)$, then $\grave{y} =$ ....

(a) 6 (b) $6x + 10$ (c) $12x$ (d) $12x + 25$

In the opposite figure :

If $\overrightarrow{AD}$ bisects $\angle BAC$

, then $\frac{dy}{dx} =$ .... at $x = 2$



(a) $\frac{1}{2}$

(b) 1

(c) $1\frac{1}{2}$

(d) 2

If $\frac{y}{x} = \frac{a^2}{x^2} + 1$, then $\frac{dy}{dx} =$ ....

(a) $1 - \frac{a}{x}$ (b) $1 + \frac{a}{x^2}$ (c) $a^2 - \frac{a}{x^2}$ (d) $1 - \left(\frac{a}{x}\right)^2$

If $f : \mathbb{R} \longrightarrow \mathbb{R}$ where $f(X) = X^3 - a X^2 + b X - 1$ and the tangent at $X = 1$ makes an angle of measure 135° with the positive direction of X-axis and the tangent at $X = 2$ is parallel to X-axis , then $3a - b =$ ……………

(a) -8 (b) -4 (c) zero (d) 8

Average rate of change of the function $f : f(x) = \frac{1}{x}$ when x changes from x_1 to $x_1 + h$ equals ....

(a) $-\frac{1}{x_1}$ (b) $\frac{-h}{x_1(x_1+h)}$ (c) $\frac{-1}{x_1(x_1+h)}$ (d) $\frac{h}{x_1(x_1+h)}$

If the function $f : f(X) = 1 + aX + bX^2$ and the variation in this function when X changes from 3 to 2 equals 7 and rate of change when $X = 3$ equals -9 , then $a^2 + b^2 =$ ……………

(a) -1 (b) 5 (c) 13 (d) 25

If the normal to the curve $y = f(x)$ at the point $(3, 4)$ make an angle of measure $\frac{3\pi}{4}$ with the positive direction of x-axis , then $\grave{f}(3) = \ldots\ldots\ldots\ldots$

(a) -1 (b) $\frac{-3}{4}$ (c) $\frac{3}{4}$ (d) 1

$\int \frac{\sqrt{x}}{\sqrt[3]{x}} \, dx = \dots\dots\dots\dots\dots + c$

(a) $\frac{6}{7} x \sqrt[6]{x}$ (b) $\frac{7}{6} x^{\frac{7}{6}}$ (c) $\frac{-6}{7} x^{\frac{7}{6}}$ (d) $\frac{-6}{7} \sqrt[6]{x}$

If $f(x) = x^2 g(x)$ and $g(5) = 10$, $\grave{g}(5) = 4$, then $\grave{f}(5) = \cdots\cdots\cdots\cdots$

(a) 40 (b) 100 (c) 200 (d) 250

If $f : f(\mathcal{X}) = \begin{cases} a\,\mathcal{X} + 5\,b & , \mathcal{X} > 2 \\ 26 & , \mathcal{X} = 2 \\ b\,\mathcal{X}^2 + 3\,a - 6 & , \mathcal{X} < 2 \end{cases}$ is differentiable at $\mathcal{X} = 2$, then $a - b =$ ……………

(a) zero (b) 4 (c) 6 (d) 8

If $f(x) = x^2 + 2$, $g(x) = x + 2$, then $\frac{d}{dx}[(f \circ g)(x)] =$ .... at $x = 1$

(a) 5 (b) 6 (c) 8 (d) 10

The equation of the tangent to the curve $y = \frac{1 - 2x}{x - 2}$ at the point (1 , 1) equals ....

(a) $y = 3x - 2$ (b) $y = 2x - 3$ (c) $y = -3x + 2$ (d) $y = 2x + 3$

The average rate of change of the volume of a cube when its edge changes from 3 cm. to 5 cm. equals ....

(a) 98 (b) 49 (c) 125 (d) 9

The equation of the perpendicular to the curve $f\ (X)$ at the point $(2\ ,-1)$ is $X - 2\,y = 4$, then $f'\ (2) =$ ……………

(a) 2 (b) -2 (c) 1 (d) -1

$\int (x+2)(x-2)\,dx =$ ……………

(a) $x + 4 + c$ (b) $\frac{1}{3}x^3 - 4x + c$ (c) $x^2 - 4x + c$ (d) $(x^2 - 4)^2 + c$

The derivative of x^6 with respect to x^3 is ....

(a) x^3 (b) $2x^3$ (c) $3x^2$ (d) $6x^6$

If $\grave{f}(x) \times g(x) + \grave{g}(x) \times f(x) = x + \frac{1}{x}$, then $\frac{d}{dx}[f(x) \times g(x)] = \text{...............}$ at $x = 2$

(a) $\frac{3}{4}$ (b) 1 (c) $\frac{5}{2}$ (d) 3

$\int f(X) \cdot \grave{f}(X)\, dX =$ ……………

(a) $f(X) + c$ (b) $\frac{1}{2}[f(X)]^2 + c$ (c) $\frac{1}{2} f(X) + c$ (d) $[f(X)]^2 + c$

The slope of the curve to the function $y = (2\,x - 3)^5$ at $x = 2$ equals ....

(a) 1 (b) $\frac{1}{12}$ (c) 5 (d) 10

If $f(3X+1) = (h \circ g)(X)$ and $g(-1) = 4$, $\grave{g}(-1) = 2$, $\grave{h}(4) = 6$, then $\grave{f}(-2) = \cdots\cdots\cdots$

(a) 1 (b) 2 (c) 3 (d) 4

If $\frac{d}{d\mathcal{X}}(a\,\mathcal{X})^3 = 24$ at $\mathcal{X} = 1$, then a = ……………

(a) $\frac{1}{4}$ (b) $1\frac{1}{2}$ (c) 1 (d) 2

If $y = (z + 1)^3$, $z = x^5 - 1$, then $\frac{dy}{dx} =$ ....

(a) x^{15} (b) x^8 (c) $15x^{14}$ (d) $8x^7$

If f is a function and $f^{\backslash}(1) = 2f(1) = 4$, then $\lim_{h \to 0} \frac{f(1+h)-2}{3h} = \cdots$

$(a) zero$ $(b) \frac{4}{3}$ $(c) 12$ $(d) \frac{1}{4}$

If $x^2 + y^2 = y$, then ....

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

$\int \frac{x - \frac{1}{2}}{\sqrt{2x-1}} \, dx = \dots\dots\dots\dots + c$

(a) $\frac{1}{6}\sqrt{2x-1}$ (b) $\frac{1}{6}\sqrt{(2x-1)^3}$ (c) $\frac{1}{6\sqrt{2x-1}}$ (d) $\frac{1}{2}\sqrt{(2x-1)^3}$

If $f(\mathcal{X}) = (2\mathcal{X} + 1) \times h(\mathcal{X})$ and $f(2) = 15$, $\grave{h}(2) = 4$, then $\grave{f}(2) = \cdots\cdots\cdots\cdots\cdots$

(a) 26 (b) 28 (c) 30 (d) 32

The average rate of change of f where $f(x) = x^2 + 3x + 5$ when x varies from 1 to 3 equals ....

(a) 1 (b) 3 (c) 7 (d) 9