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MAT 105W

Paret: A CO- CEAL SEAL OF CAT

Amn: to the que? NO-1 a(i)

 $f(x) = \ln(x-1)$

Herre, the value f(x) will be treal if 2-1>0 ⇒ x>1

.. Df = {x: x>1} = (1,00)

Agam,

> In (24) = y

>> x-1=0 y

> x = e +1

Herre, the value of y in treal for all treal values

 $\alpha(n)$

here the deman some

tr & -(x)

of × . Name ! Omen hands Registration Number: 2013851089 Al- 28: = (-00,00) X 7 f(x) -.69 1.38 1.79 Ans to the speece No 1 Henry the value from will the complete · 0(1-x 11 cx : x ; x = 10. (x) M = (x) = += a (11) $f(x) = e^{x} + 1$

since ex in continuous tore all real number hence the domain in,

= (-00 00)

Agam, jour on of ball $y = f(x) = e^x + 1$ => ex+1 = y > ex = y-1 f(x)= 13+5mx:05 x5 1/2 >> x = m (y-1) Here the value of or will be real it, for differentiability of x 1/2 0<1-E 80, the tange in $Rf = dy \cdot y \in \mathbb{R}, y > 1$ (1, 1) + 2 - 2 mil X (4)

Ano: to the que: No-1

b

$$f(x) = \begin{cases} 1; & x < 0 \\ 1 + \sin x; & 0 < x < \frac{\pi}{2} \\ 2 + (x - \frac{\pi}{2})^2; & x > \frac{\pi}{2} \\ 1 + \cos x & \sin x & \cos x \end{cases}$$

$$for differentiability of $x = \frac{\pi}{2}$$$

11 1(21) 0211

r 1136

0<1.1

for differentiability at x=1/2

$$f(\frac{\Pi}{2}+h)-f(\frac{\Pi}{2})$$

 $Rf'\left(\frac{\Pi}{2}\right) = \lim_{h \to 0} \frac{f(\frac{\Pi}{2} + h) - f(\frac{\Pi}{2})}{h \to 0}$

$$= \lim_{h \to 0+} \frac{2 + (\frac{11}{2} + h - \frac{11}{2})^2 - 2}{h}$$

$$= \lim_{h \to 0^+} \frac{h^2}{h}$$

= 0

Lf'(
$$\frac{\pi}{2}$$
) = $\lim_{h\to 0^{-}} \frac{f(\frac{\pi}{2}+h)-f(\frac{\pi}{2})}{h}$

$$= \lim_{h \to 0^{-}} \frac{\cosh - 1}{h}$$

$$= \lim_{h \to 0^{-}} \frac{-2\sin^{2}h/2}{h}$$

$$= -2 \lim_{h \to 0^{-}} \frac{(\frac{\sin \frac{h}{2}}{2})^{2}}{h^{2}} \frac{h}{4} \times h \times cos_{2}$$

$$= -2 \cdot \frac{1}{4} \cdot \frac{0}{4} \times h \times cos_{2}$$

$$= -2 \cdot \frac{1}{4} \cdot \frac{0}{4} \times h \times cos_{2}$$

$$= 0$$

$$\therefore Rf'(\frac{\pi}{2}) = Lf'(\frac{\pi}{2}) + \frac{1}{200} \times cos_{2}$$

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Ama: to the que: No-3
$$\frac{2^{1+x}+4^{1-x}}{2^{x}} dx$$

$$= \int \frac{2^{3+3x}+2^{2-2x}}{2^{1+2x}} dx$$

$$= \frac{2^{3+2x}}{2\ln 2} + \frac{2^{3-3x}}{2^{3+2x}} dx$$

$$= \frac{4 \cdot 2^{2x}}{2^{x}} dx + \int \frac{2^{2-2x}}{2^{x}} dx - \int \frac{2^{3+2x}}{2^{x}} dx + \int \frac{2^{2-3x}}{2^{x}} dx - \int \frac{2^{3+2x}}{2^{x}} dx + \int \frac{2^{2-3x}}{2^{x}} dx + \int \frac{2^{2-3x}}{$$

$$\int_{0}^{\infty} \frac{x dx}{(x^{2}+o^{2})(x^{2}+b^{2})}$$

$$= \lim_{\epsilon \to \infty} \int_{0}^{\epsilon} \frac{x dx}{(x^{2} + 0^{2})(x^{2} + b^{2})}$$

> xax = 1/2 az

When, $x = \epsilon$, $z = \epsilon^2$

$$\lim_{\epsilon \to \infty} \frac{1}{2} \int_{-\infty}^{\epsilon^2} \frac{dz}{(z+a^2)(z+b^2)}$$

$$= \frac{1}{2(a^2-b^2)} \lim_{\epsilon \to \infty} \left\{ \frac{\epsilon^2}{2+b^2} - \frac{1}{2+a^2} \right\} dz$$

1 2 mle + 1 ml (m = 1)

2 (01 2m =)

M SA SA

$$= \frac{1}{2(a^2-b^2)} \lim_{\epsilon \to \infty} \left[\ln (z+b^2) - \ln (z+a^2) \right]_{6}^{\epsilon^2}$$

$$= \frac{1}{2(a^2 b^2)} \lim_{\epsilon \to \infty} \left[m \frac{Z + b^2}{Z + 0^2} \right]_0^{\epsilon^2}$$

$$= \frac{1}{2(a^2-b^2)} \lim_{\epsilon \to \infty} \left(\ln \frac{\epsilon^2 + b^2}{\epsilon^2 + a^2} - \ln \frac{b^2}{a^2} \right)$$

$$= \frac{1}{2(a^2-b^2)} \left[\lim_{\epsilon \to \infty} \ln \frac{1+\left(\frac{b^2}{\epsilon^2}\right)}{1+\left(\frac{a^2}{\epsilon^2}\right)} + \ln \left(\frac{a^2}{b^2}\right) \right]$$

New, $= \frac{1}{2(a^2-b^2)} \left[\ln 1 + 2 \ln \frac{a}{b} \right]$ $\frac{1}{2(\alpha^2-b^2)}\left(0+2m\frac{\alpha}{b}\right)$ sbyle xbx e $= \frac{1}{a^2 - h^2} \operatorname{m} \frac{a}{h}$ 30, the equation atond, (5015) (2107) (2107) 2502 620 1 (545) de 2 (502 5) de 2 1 (10+5) n1 - (1015) n1 mil - 10+65018