WORKSHEET(DIFFERENTIAL CALCULUS)

CLASS XII (OPTIONAL)

1. Verify Lagrange's Mean Value Theorem for the function $f(x) = e^x \ in \ [0,1]$

2. Find $\frac{dy}{dx}$ if x $=\frac{sin_t^3}{\sqrt{cos2t}}$ and y $=\frac{cos_t^3}{\sqrt{cos2t}}$

3. If $x^y = e^{x-y}$ prove that $\frac{dy}{d\ x} = \frac{logx}{(1+logx)^2}$

4. Find the second derivative of e^{xtanx}

5. Find the differential coefficient of tanx by first principle.

6. Verify Rolle's Theorem for f(x) = sinx

7. = 0

8. Find $\frac{d_y^2}{dx^2}$ if x= a $(\theta + sin\theta)$, y =a $(1 - cos\theta)$

9. If y= a cos (logx)+ bsin (logx), x> +cosx -1 in $\left[0,\frac{\pi}{2}\right]$

10. If y =2sinx+3cosx .prove that y $+\frac{d_y^2}{dx^2}$ 0 prove that $x^2y'' + xy' +y =0$

11. If y = tanx +secx ,prove that $\frac{d_y^2}{dx^2} = \frac{cosx}{(1-sinx)^2}$

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