BALJINDER KAUR CLASSES

(IISER PROFESSOR)

MATHS

Class 12 - Mathematics

Time Allowed: 1 hour **Maximum Marks: 30**

1. If y = $\sqrt{x} + \frac{1}{\sqrt{x}}$, show that $2x\frac{dy}{dx}$ + y = $2\sqrt{x}$. **[2]**
2. Differentiate $(ax^2 + bx + c)^6$ w.r.t. x. **[2]**
3. Find the derivative of the function given by f(x) = sin (x^2). **[2]**
4. Find $\frac{dy}{dx}$, when: $x^2 + y^2 = 4$. **[2]**
5. Differentiate the function with respect to x: $\cos^{-1}\left\{\frac{x}{\sqrt{x^2+a^2}}\right\}$ **[3]**
6. Differentiate the function with respect to x: $\tan^{-1}\left(\frac{1+\cos x}{\sin x}\right)$. **[3]**
7. If $y = \log\sqrt{\frac{1+\tan x}{1-\tan x}}$, prove that $\frac{dy}{dx} = \sec 2x$. **[3]**
8. If y log x = (x - y), prove that $\frac{dy}{dx} = \frac{\log x}{(1+\log x)^2}$. **[3]**
9. Differentiate the function with respect to x: $x^{\sin^{-1} x}$ **[2]**
10. Differentiate the function with respect to x: $(\tan x)^{1/x}$ **[2]**
11. If y = 2sin x + 3cos x, show that $\frac{d^2y}{dx^2} + y = 0$ **[3]**
12. If y = sin (sin x), prove that $\frac{d^2y}{dx^2} + \tan x\frac{dy}{dx} + y\cos^2 x = 0$ **[3]**