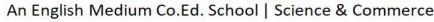


## IREE ACA SR. SEC. SCHOOL — An English Medium Co.Ed. School | Science & Commerce





W: www.vsajaipur.com | E: vsajaipur@gmail.com M.: +91 9460356652, 8058999828 Add.: 84, Krishna Vihar, Behind Narayan Niwas, Gopalpura Bypass, Jaipur - 302015



/vsajaipur | 💟 /vsajaipur | 🚨 /vidyashreeacademy | 📵 /vsa\_jaipur

Class - 12th

**Chapter-7** 

**Subject Maths** 

Differentiation

Worksheet-33

Differentiate the following functions with respect to  $x ext{ (Q 1-8)}$ 

$$1. \quad \sin^{-1}(x\sqrt{x}); \quad 0 \le x \le 1$$

2. 
$$\frac{\cos^{-1} x/2}{\sqrt{2x+7}}$$
;  $-2 < x < 2$ 

3. 
$$\cot^{-1}\left\{\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1+\sin x}-\sqrt{1-\sin x}}\right\}; \quad 0 < x < \frac{\pi}{2}$$
 4.  $x^3 \cdot e^x \cdot \sin x$ 

4. 
$$x^3 \cdot e^x \cdot \sin x$$

5. 
$$\log\left(\frac{x}{a^x}\right)$$

6. 
$$(x \log x)^{\log x}$$

7. 
$$x^{x^2-3} + (x-3)^{x^2}$$
;  $x > 3$ 

8. 
$$\sin^{-1} x + \sin^{-1} \sqrt{1 - x^2}$$

9. If 
$$\log x = \tan^{-1} \left( \frac{y - x^2}{x^2} \right)$$
, then find  $\frac{dy}{dx}$  10. If  $y = 12(1 - \cos t)$ ,  $x = 10(t - \sin t)$ , then find  $\frac{dy}{dx}$ 

11. If 
$$\cos^{-1}\left(\frac{x^2-y^2}{x^2+y^2}\right) = \tan^{-1} a$$
, then prove that  $\frac{dy}{dx} = \frac{y}{x}$ 

12. If 
$$\sin y = x \sin(a + y)$$
, then prove that  $\frac{dy}{dx} = \frac{\sin^2(a + y)}{\sin a}$ 

13. If 
$$y = (\sin x - \cos x)^{(\sin x - \cos x)}$$
, then find  $\frac{dy}{dx}$ .

14. If  $y = \sin(\sin x)$ , then show that

$$\frac{d^2y}{dx^2} + \tan x \cdot \frac{dy}{dx} + y\cos^2 x = 0.$$