

CH:-DERIVATIVES (STANDARD) CLASS XII

WORKSHEET

ANSWER THE FOLLOWING QUESTIONS :-

1. Differentiate the function $\sin(x^3+5)$ with respect to x .
2. Differentiate the function $\cos x^3 \cdot \sin^2(x^5)$ with respect to x .
3. Find dy/dx if $x-y=5$.
4. Differentiate the function $\tan^{-1}x$ with respect to x .
5. Differentiate the function $x^3 + x^2 y + xy^2 + y^3$ with respect to x .
6. Differentiate the function $e^{\sin^{-1}x}$ with respect to x .
7. Differentiate the function $\sqrt{\frac{(x-4)(x^2+4)}{3x^2+4x+5}}$ with respect to x .
8. Find dy/dx if $x=at^2, y=2at$.
9. If $y=\sin^{-1}x$, show that $(1-x^2)\frac{d^2y}{dx^2} + x\frac{dy}{dx} = 0$.
10. Verify Mean Value Theorem, if $f(x)=x^3-5x^2-3$ in the interval $[a, b]$, where $a=1$ and $b=3$. Find all $c \in (1, 3)$ for which $f'(c)=0$.
11. Using Rolle's theorem, find the point on the curve $y=x(x-4), x \in [0, 4]$, where the tangent is parallel to X-axis.
12. Find $\frac{d^2y}{dx^2}$ if $x=a(\cos t + t \sin t)$ and $y=a(\sin t - t \cos t)$.
13. Using mean value theorem, prove that there is a point on the curve $y=2x^2-5x+3$ between the point $A(1,0)$ and $B(2,1)$, where tangent is parallel to the chord AB . Also, find that point.
14. Discuss the continuity of secant.
15. Differentiate $\tan^{-1}\frac{x}{\sqrt{1-x^2}}$ w.r.t x $\sin^{-1}(2x\sqrt{1-x^2})$.
16. Differentiate a^x w.r.t x , where a is a positive constant.
17. If $y=\frac{8^x}{x^8}$, find $\frac{dy}{dx}$.
18. Show that $f(x)=|x-5|$ is continuous but not differentiable at $x=5$.
19. Differentiate $\tan e^x$ w.r.t e^x .
20. If $y=\tan^{-1}x$, then find $\frac{d^2y}{dx^2}$ in terms of y alone.