DPP

DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**

DATE : **DPP NO. : 8**

Topic :-DIFFERENTITATION

1. If $y=\sec^{-1}\frac{x+1}{x-1}+\sin^{-1}\frac{x-1}{x+1}$, then $\frac{dy}{dx}$ is

a) 1 b) 0 c) $\frac{x-1}{x+1}$ d) $\frac{x+1}{x-1}$

2. Let $\mathrm{g}(x)=\log f(x)$, where $f(x)$ is a twice differentiable positive function on $(0,\infty)$ such that $f(x+1)=xf(x)$.Then, for $N=1,2,3,\ldots,\mathrm{g}''\left(N+\frac{1}{2}\right)-\mathrm{g}''\left(\frac{1}{2}\right)$is equal to

a) $-4\left\{1+\frac{1}{9}+\frac{1}{25}+\ldots+\frac{1}{(2N-1)^2}\right\}$ b) $4\left\{1+\frac{1}{9}+\frac{1}{25}+\ldots+\frac{1}{(2N-1)^2}\right\}$

c) $-4\left\{1+\frac{1}{9}+\frac{1}{25}+\ldots+\frac{1}{(2N+1)^2}\right\}$ d) $4\left\{1+\frac{1}{9}+\frac{1}{25}+\ldots+\frac{1}{(2N+1)^2}\right\}$

3. If $y=\log_{x^2+4}(7x^2-5x+1)$, then $\frac{dy}{dx}$ is equal to

a) $\log_e(x^2+4)\cdot\left\{\frac{14x-5}{7x^2-5x+1}-\frac{2xy}{x^2+4}\right\}$

b) $\frac{1}{\log_e(x^2+4)}\left\{\frac{14x-5}{7x^2-5x+1}-\frac{2xy}{x^2+4}\right\}$

c) $\log_e(7x^2-5x+1)\left\{\frac{2x}{x^2+4}-\frac{(14x-5)y}{7x^2-5x+1}\right\}$

d) $\frac{1}{\log_e(7x^2-5x+1)}\left\{\frac{2x}{x^2+4}-\frac{(14x-5)y}{7x^2-5x+1}\right\}$

4. If $\sin y=e^{-x\cos y}=e$,then$\frac{dy}{dx}at$ $(1,\pi)$ is equal to

a) $\sin y$ b) $-x\cos y$ c) e d) $\sin y-x\cos y$

5. If $y=\tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right)$, then $y'(0)$ is

a) $\frac{1}{2}$ b) 0 c) 1 d) -1

6. Differential coefficient of $\sqrt{\sec\sqrt{x}}$is

a) $\frac{1}{4\sqrt{x}}\sec\sqrt{x}\sin\sqrt{x}$ b) $\frac{1}{4\sqrt{x}}(\sec\sqrt{x})^{3/2}.\sin\sqrt{x}$

c) $\frac{1}{2}\sqrt{x}\sec\sqrt{x}\sin\sqrt{x}$ d) $\frac{1}{2}\sqrt{x}(\sec\sqrt{x})^{3/2}.\sin\sqrt{x}$

7. If $f(x)=\sin x$and $g(x)=sgn\sin x$, then $g'(1)$ equals

a) 0 b) $-\cos 1$ c) $\cos 1$ d) None of these

8. The derivative of $y = x^{\text{In } x}$ is

a) $x^{\text{In } x}$ In x b) $x^{\text{In } x-1}$In x c) $2x^{\text{In } x-1}$In x d) $x^{\text{In } x-2}$

9. If $x = e^t \sin t$, $y = e^t \cos t$, then $\frac{d^2y}{dx^2}$ at $x = \pi$ is

a) $2e^{\pi}$ b) $\frac{1}{2}e^{\pi}$ c) $\frac{1}{2e^{\pi}}$ d) $\frac{2}{e^{\pi}}$

10. If $f'(x) = \sin(\log x)$ and $y = f\left(\frac{2x+3}{3-2x}\right)$, then $\frac{dy}{dx}$ equals

a) $\sin(\log x) \cdot \frac{1}{x \log x}$

b) $\frac{12}{(3-2x)^2} \sin\left\{\log\left(\frac{2x+3}{3-2x}\right)\right\}$

c) $\sin\left\{\log\left(\frac{2x+3}{3-2x}\right)\right\}$

d) None of these

11. If $r = [2\phi + \cos^2(2\phi + \pi/4)]^{1/2}$, then what is the value of the derivative of $dr/d\phi$ at $\phi = \pi/4$?

a) $2\left(\frac{1}{\pi+1}\right)^{1/2}$ b) $2\left(\frac{2}{\pi+1}\right)^{2}$ c) $\left(\frac{2}{\pi+1}\right)^{1/2}$ d) $2\left(\frac{2}{\pi+1}\right)^{1/2}$

12. For $|x| < 1$, let $y = 1 + x + x^2$...to ∞, then $\frac{dy}{dx}$ equal to

a) $\frac{x}{y}$ b) $\frac{x^2}{y^2}$ c) $\frac{x}{y^2}$ d) $xy^2 + y$

13. If $f(x+y) = 2f(x)f(y)$, $f'(5) = 1024(\log 2)$ and $f(2) = 8$, then the value of $f'(3)$ is

a) 64 (log 2)b)   128 (log 2)c)   256d)   256 (log 2)

14. The value of differentiation of e^{x^2} with respect to e^{2x-1} at $x = 1$ is

a) e b) 0   c) e^{-1} d) 1

15. Let $x = \log_e t, t > 0$ and $y + 1 = t^2$. Then, $\frac{d^2x}{dy^2}$ is equal to

a) $4e^{2x}$ b) $-\frac{1}{2}e^{-4x}$ c) $-\frac{3}{4}e^{5x}$ d) $4e^{x}$

16. If $y = \cot^{-1}(\cos 2x)^{1/2}$, then the value of $\frac{dy}{dx}$ at $x = \frac{\pi}{6}$ will be

a) $\left(\frac{2}{3}\right)^{1/2}$ b) $\left(\frac{1}{3}\right)^{1/2}$ c) $(3)^{1/2}$ d) $(6)^{1/2}$

17. If $P(x)$ is a polynomial such that $P(x^2+1) = \{P(x)\}^2 + 1$ and $P(0) = 0$, then $P'(0)$ is equal to

a) -1 b) 0   c) 1   d) None of these

18. If $y = (\cos x^2)^2$, then $\frac{dy}{dx}$ is equal to

a) $-4x \sin 2x^2$ b) $-x \sin x^2$ c) $-2x \sin 2x^2$ d) $-x \cos 2x^2$

19. Let $f(x) = 2^{2x-1}$ and $g(x) = -2^x + 2x \log 2$. Then the set of points satisfying $f'(x) > g'(x)$, is

a) $(0, 1)$ b) $[0, 1)$ c) $(0, \infty)$ d) $[0, \infty)$

20. $\frac{d}{dx}\left\{\tan^{-1}\left(\frac{2x}{1-x^2}\right) + \tan^{-1}\left(\frac{3x-x^3}{1-3x^2}\right) - \tan^{-1}\left(\frac{4x-4x^3}{1-6x^2+x^4}\right)\right\}$ is equal to

a) $\frac{1}{\sqrt{1-x^2}}$ b) $-\frac{1}{\sqrt{1-x^2}}$ c) $\frac{1}{1+x^2}$ d) $-\frac{1}{1+x^2}$