

CLASS : XIIth
DATE :

SUBJECT : MATHS
DPP NO. : 4

Topic :-DIFFERENTITATION

1. If $y = \sin px$ and y_n is the n th derivative of y , then $\begin{vmatrix} y & y_1 & y_2 \\ y_3 & y_4 & y_5 \\ y_6 & y_7 & y_8 \end{vmatrix}$ is equal to

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a) 1	b) 0	c) -1	d) None of these
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2. If $y = 1 - x + \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} - \dots$, then $\frac{d^2y}{dx^2}$ is equal to

a) x	b) $-x$	c) $-y$	d) y
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3. If $f(4) = 4$, $f'(4) = 1$, then $\lim_{x \rightarrow 4} \frac{2 - \sqrt{f(x)}}{2 - \sqrt{x}}$ is equal to

a) -1	b) 1	c) 2	d) -2
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4. If $x = \frac{2at}{1+t^3}$ and $y = \frac{2at^2}{(1+t^3)^2}$, then $\frac{dy}{dx}$ is

a) ax	b) a^2x^2	c) $\frac{x}{a}$	d) $\frac{x}{2a}$
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5. $y = e^{a \sin^{-1} x} \Rightarrow (1 - x^2)y_{n+2} - (2n + 1)xy_{n+1}$ is equal to

a) $-(n^2 + a^2)y_n$	b) $(n^2 - a^2)y_n$	c) $(n^2 + a^2)y_n$	d) $-(n^2 - a^2)y_n$
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6. If $\sec\left(\frac{x-y}{x+y}\right) = a$, then $\frac{dy}{dx}$ is

a) $\frac{y}{x}$	b) $-\frac{y}{x}$	c) $\frac{x}{y}$	d) $-\frac{x}{y}$
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7. If $y = x + x^2 + x^3 \dots \infty$, where $|x| < 1$, then for $|y| < 1$, $\frac{dx}{dy}$ is equal to

a) $y + y^2 + y^3 + \dots \infty$	b) $1 - y + y^2 - y^3 + \dots \infty$
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8. $\frac{d}{dx} \sqrt{\frac{1 - \sin 2x}{1 + \sin 2x}}$ is equal to

a) $\sec^2 x$	b) $-\sec^2\left(\frac{\pi}{4} - x\right)$	c) $\sec^2\left(\frac{\pi}{4} + x\right)$	d) $\sec^2\left(\frac{\pi}{4} - x\right)$
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9. Derivative of $\log_{10} x$ with respect to x^2 is

a) $2x^2 \log_e 10$	b) $\frac{\log_{10} e}{2x^2}$	c) $\frac{\log_e 10}{2x^2}$	d) $x^2 \log_e 10$
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10. If $y = \ln\left(\frac{x}{a+bx}\right)^x$, then $x^3 \frac{d^2y}{dx^2}$ is equal to
 a) $\left(\frac{dy}{dx} + x\right)^2$
 b) $\left(\frac{dy}{dx} - y\right)^2$
 c) $\left(x \frac{dy}{dx} + y\right)^2$
 d) $\left(x \frac{dy}{dx} - y\right)^2$
11. If f be a polynomial, then the second derivative of $f(e^x)$ is
 a) $f'(e^x)$
 b) $f''(e^x)e^x + f'(e^x)$
 c) $f''(e^x)e^{2x} + f'(e^x)e^x$
 d) $f''(e^x)e^{2x} + f'(e^x)e^x$
12. If $2x^2 - 3xy + y^2 + x + 2y - 8 = 0$, then $\frac{dy}{dx}$ is equal to
 a) $\frac{3y - 4x - 1}{2y - 3x + 2}$
 b) $\frac{3y + 4x + 1}{2y + 3x + 2}$
 c) $\frac{3y - 4x + 1}{2y - 3x - 2}$
 d) $\frac{3y - 4x + 1}{2y + 3x + 2}$
13. If $y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x + \dots \infty}}}$, then $(2y - 1)\frac{dy}{dx}$ is equal to
 a) $\sin x$
 b) $-\cos x$
 c) $\cos x$
 d) $-\sin x$
14. If $2^x + 2^y = 2^{x+y}$, then the value of $\frac{dy}{dx}$ at $x = y = 1$, is
 a) 0
 b) -1
 c) 1
 d) 2
15. If $y = \sec(\tan^{-1} x)$, then $\frac{dy}{dx}$ is equal to
 a) $\frac{x}{\sqrt{1+x^2}}$
 b) $-\frac{x}{\sqrt{1+x^2}}$
 c) $\frac{x}{\sqrt{1-x^2}}$
 d) None of these
16. Let $f(x) = (x-7)^2(x-2)^7$, $x \in [2,7]$. The value of $\theta \in (2,7)$ such that $f'(\theta) = 0$ is equal to
 a) $\frac{49}{4}$
 b) $\frac{53}{9}$
 c) $\frac{53}{7}$
 d) $\frac{49}{9}$
17. If $x^2 + y^2 = t - \frac{1}{t}$ and $x^4 + y^4 = t^2 + \frac{1}{t^2}$, then $x^3 y \frac{dy}{dx}$ equals
 a) 0
 b) 1
 c) -1
 d) None of these
18. The value of $\frac{d}{dx}(|x-1| + |x-5|)$ at $x = 3$, is
 a) -2
 b) 0
 c) 2
 d) 4
19. If $\sin^{-1} x + \sin^{-1} y = \frac{\pi}{2}$, then $\frac{dy}{dx}$ is equal to
 a) $\frac{x}{y}$
 b) $-\frac{x}{y}$
 c) $\frac{y}{x}$
 d) $-\frac{y}{x}$
20. If $f(x) = \frac{1}{1-x}$, then the derivative of the composite function $f[f\{f(x)\}]$ is equal to
 a) 0
 b) $\frac{1}{2}$
 c) 1
 d) 2