



INDIAN SCHOOL AL WADI AL KABIR
Class XI, Mathematics *Worksheet 1- Limits & Derivatives*
16-01-2025

MCQ

Q.1.	$\lim_{x \rightarrow 2} \frac{x^5 - 32}{x - 2} :$							
	A.	32	B.	80	C.	0	D.	∞
Q.2	If $3\sin x + 5\cos x = 2$, then $\frac{dy}{dx}$ at $x = \frac{\pi}{2}$:							
	A.	3	B.	8	C.	-5	D.	-2
Q.3	if $y = \sin x \cdot \cos x$, then $\frac{dy}{dx}$							
	A.	$\sin x \cos x$	B.	1	C.	$\sin 2x$	D.	$\cos 2x$
Q.4	$\lim_{x \rightarrow 0} \frac{x + \sin x}{x + \tan 2x}$							
	A.	0	B.	$\frac{1}{2}$	C.	$\frac{2}{3}$	D.	$\frac{3}{2}$
Q.5	$\lim_{x \rightarrow 0} \frac{\cos 2x - 1}{\cos x - 1} :$							
	A.	2	B.	3	C.	4	D.	0
Q.6	$\lim_{x \rightarrow 3} \frac{x^3 - 27}{x^2 - x - 6} :$							
	A.	$\frac{27}{5}$	B.	$\frac{18}{5}$	C.	$\frac{6}{3}$	D.	$\frac{3}{2}$
Q.7	$\lim_{x \rightarrow 0} \frac{1 - \cos 2x}{x^2} :$							
	A.	0	B.	1	C.	2	D.	-2

Q.8	If $f(x) = \frac{x^{100}}{100} + \frac{x^{99}}{99} + \frac{x^{98}}{98} + \dots + \frac{x^2}{2} + x + 1$ then $f'(0) + f'(1) =$							
	A	0	B	1	C	100	D	101
Q.9	Given: $f(x) = \begin{cases} k(x^2 + 3x), & x \leq 2 \\ 3x + 4, & x > 2 \end{cases}$ and $\lim_{x \rightarrow 2} f(x)$ exists, then value of k:							
	A	0	B	1	C	3	D	10
Q.10	$\lim_{x \rightarrow 0} \frac{(x+1)^{100} - 1}{x} :$							
	A	100	B	0	C	1	D	Does not exist
Q.11	$\frac{d}{dx} \left(\frac{x}{x+1} \right) :$							
	A	$\frac{1}{x+1}$	B	$\frac{1}{(x+1)^2}$	C	$-\frac{1}{(x+1)^2}$	D	$\frac{2x}{(x+1)^2}$
Q.12	$\frac{d}{dx} \left[\left(\sqrt{x} + \frac{1}{\sqrt{x}} \right)^2 \right] :$							
	A	$2 \left(\sqrt{x} + \frac{1}{\sqrt{x}} \right)$	B	$\frac{x^2 - 1}{x^2}$	C	$1 - \frac{1}{x}$	D	$\frac{x - 1}{x}$
	Short answer type (2/3marks)							
Q.13	Show that $\lim_{x \rightarrow 0} \frac{ x }{x}$, $x \neq 0$, does not exist.							
Q.14	Evaluate : $\lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos x}{\pi - 2x}$							
Q.15	Using first principle find the derivative of $\sin 2x$ with respect to x .							
Q.16	If $y = \frac{1 - \cos x}{1 + \cos x}$, then find $\frac{dy}{dx}$.							
Q.17	If $f(x) = (4x^3 - 9x + 5)(x^2 - 1)$ then find $f'(0)$							
Q.18	If $y = \sqrt{\frac{\sec 2x - 1}{\sec 2x + 1}}$, then prove: $\frac{dy}{dx} = \sec^2 x$							

Answers	Q1	B	Q2	C	3.	D	Q4	C
	Q5	C	Q6	A	7	C	Q8	D
	Q9	B	Q10	A	11	B	Q12	B
	Q14	$\frac{1}{2}$	Q16	$\frac{2\sin x}{(1 + \cos x)^2}$		Q17	9	
