ASSIGNMENT CLASS XI LIMITS

Evaluate the following limits(Q. 1-28):

1. $\lim_{x\to 0}\dfrac{\sqrt{1+3x}-\sqrt{1-3x}}{x}$

2. $\lim_{x\to 1}\dfrac{(2x-3)(\sqrt{x}-1)}{2x^2+x-3}$

3. $\lim_{x\to -2}\dfrac{x^3+8}{x+2}$

4. $\lim_{x\to 3}\dfrac{x^2-4x+3}{x^2-2x-3}$

5. $\lim_{x\to 2}\dfrac{x^5-32}{x^3-8}$

6. $\lim_{x\to 0}\dfrac{\sqrt{2-x}-\sqrt{2+x}}{x}$

7. $\lim_{x\to 0}\dfrac{x}{\sqrt{1+x}-1}$

8. $\lim_{x\to 1}\left(\dfrac{1}{x^2+x-2}-\dfrac{x}{x^3-1}\right)$

9. $\lim_{x\to 2}\left(\dfrac{1}{x-2}-\dfrac{2(2x-3)}{x^3-3x^2+2x}\right)$

10. $\lim_{x\to 0}\dfrac{1-\cos x}{x^2}$

11. $\lim_{x\to 4}\dfrac{x^{3/2}-8}{x-4}$

12. $\lim_{x\to 3}\dfrac{x^5-243}{x^2-9}$

13. $\lim_{x\to 2}\dfrac{x^2-4}{\sqrt{x+2}-\sqrt{3x-2}}$

14. $\lim_{x\to 0}\dfrac{1-\cos mx}{1-\cos nx}$

15. $\lim_{x\to 0}\dfrac{\sin 2x+\sin 6x}{\sin 5x-\sin 3x}$

16. $\lim_{x\to \pi}\dfrac{1+\cos x}{\tan^2 x}$

17. $\lim_{x\to 0}\dfrac{x\tan x}{1-\cos x}$

18. $\lim_{x\to 0}\dfrac{\operatorname{cosec} x-\cot x}{x}$

19. $\lim_{x\to 0}\dfrac{\tan x-\sin x}{\sin^3 x}$

20. $\lim_{x\to 0}\dfrac{\tan x-\sin x}{x^3}$

21. $\lim_{x\to 0}\dfrac{\sin 3x+7x}{4x+\sin 2x}$

22. $\lim_{x\to 0}\dfrac{x\tan 4x}{1-\cos 4x}$

23. $\lim_{x\to 0}\dfrac{x^2-\tan 2x}{\tan x}$

24. $\lim_{x\to 0}\dfrac{1-\cos 3x}{x^2}$

25. $\lim_{x\to \pi/2}(\sec x-\tan x)$

26. $\lim_{x\to \pi/4}\dfrac{\sin x-\cos x}{x-\pi/4}$

27. $\lim_{x\to \pi/4}\dfrac{\sec^2 x-2}{\tan x-1}$

28. $\lim_{x\to a}\dfrac{\sin x-\sin a}{x-a}$

29. If $\lim_{x\to 3}\dfrac{x^n-3^n}{x-3}=108$ and $n\in N$, find n.

30. If $\lim_{x\to 0}\dfrac{x^4-1}{x-1}=\lim_{x\to 0}\dfrac{x^3-k^3}{x-k}$, find all values of k.

31. Find the value of k so that $\lim_{x\to -1} f(x)$ may exist, where $f(x)=\begin{cases} x^3-3x+7 & x\le -1 \\ 3x+k & x\ge -1 \end{cases}$.

32. If $f(x)=\begin{cases} 5x-4 & x\le 1 \\ 4x^2-3x & x>1 \end{cases}$, find $\lim_{x\to 1} f(x)$.

33. Let $f(x)=\begin{cases} \dfrac{x-|x|}{x} & x\neq 0 \\ -2 & x=0 \end{cases}$, show that $\lim_{x\to 0} f(x)$ does not exist.

ANSWERS

1. 3	2. $\frac{-1}{10}$	3. 12	4. $\frac{1}{2}$	5. $\frac{20}{3}$	6. $\frac{-1}{\sqrt{2}}$	7. 2	8. $\frac{-1}{9}$
9. $\frac{-1}{2}$	10. $\frac{1}{2}$	11. 3	12. $\frac{135}{2}$	13. –8	14. $\frac{m^2}{n^2}$	15. 4	16. $\frac{1}{2}$
17. 2	18. $\frac{1}{2}$	19. $\frac{1}{2}$	20. $\frac{1}{2}$	21. $\frac{5}{3}$	22. $\frac{1}{2}$	23. –2	24. $\frac{9}{2}$
25. 0	26. $\sqrt{2}$	27. 2	28. $\cos a$	29. 4	30. $\pm 2/\sqrt{3}$	31. 12	32. 1