Evaluate the indicated limits.

1. $\lim_{x\to 2} \frac{x-2}{\sqrt{2+x}}$
2. $\lim_{x\to 1} \frac{x3-1}{x-1}$
3. $\lim_{x\to 1} \left[\frac{1}{1-x} - \frac{3}{1-x^2}\right]$
4. $\lim_{x\to 0} \frac{\csc x - \cot x}{x}$
5. $\lim_{x\to 0} \frac{\sin ax}{sinbx}$
6. $\lim_{x\to 0} \text{x sin } (\frac{1}{x})$
7. $\lim_{x\to 0} \frac{1-cosx}{x}$
8. $\lim_{y\to x} \frac{y^{2/3}-x^{2/3}}{y-x}$
9. $\lim_{x\to \pi} \frac{\tan (sinx)}{sinx}$
10. $\lim_{x\to 0} Sin(\frac{1}{x})$
11. $\lim_{x\to \infty} \frac{\sqrt{x^2+1}}{x+1}$
12. $\lim_{x\to \infty} \frac{5x^3+3x^2-1}{x-4x^4}$
13. $\lim_{x\to \infty} \frac{a^x-1}{x}$
14. $\lim_{x\to \infty} (1+\frac{2}{\text{x}})^{\text{x}}$
15. $\lim_{x\to \infty} (1-\frac{1}{\text{x}})^{\text{x}}$
16. $\lim_{x\to \infty} (\frac{x}{1+x})^x$
17. $\lim_{x\to \infty} \frac{x^4+2x^2+6}{x^2+7}$
18. $\lim_{x\to \infty} \left[\frac{x^2}{1+x} - \frac{x^2}{x+3}\right]$
19. $\lim_{x\to \infty} \left(x - \sqrt{x^2-a^2}\right)$
20. $\lim_{x\to \infty} \frac{x^2+1}{x^{3/2}}$
21. $\lim_{x\to \infty} \frac{3-2x^4}{1+x}$
22. $\lim_{x\to -1} \frac{x^{1/3}+1}{1+x}$

23. $\lim_{x\to 3}\left(\frac{1}{x-3}-\frac{1}{|x-3|}\right)$

24. f(x) = x^2+3 if x$\leq$ 1

= x + 1 x > 1

25. = 3 x ≤ -2

f(x) $= -\frac{1}{2}x^2 \quad -2 \leq x < 2$

$= 3 \quad x \geq 2$

7. $\ln \frac{y_3^2 - x_3^2}{y-x}$ 8. $ln\ \frac{\tan(sinx)}{sinx}$ 9. $\ln x \sin\left(\frac{1}{x}\right)$

10. $\ln \sin\left(\frac{1}{x}\right)$ 11.$\ln \frac{\sqrt{x^2+1}}{x+1}$ 12. Ln $\frac{4x^3 - 2x^2}{3x^3-5}$ 13. Ln $(1+\frac{2}{x})^x$

14. Ln $(1+\frac{1}{x})^2$ 15. Ln $(\frac{x}{1+x})^x$ 16. Ln $(\frac{a^x-1}{x})$ a> 1 17. Ln $\frac{x^4 - 2x^2+6}{x^2+1}$ $_{y\to x}$ $_{x\to Л}$ $_{x\to 0}$

18. $_{x\to 0}$ln $\left[\frac{x^2}{x+1}-\frac{x^2}{x+3}\right]$ $_{x\to \infty}$ 19. $_{x\to \infty}$Ln $(x-\sqrt{x^2-a^2})$ $_{x\to \infty}$ 20. Ln $\frac{x^2+1}{x^{3/2}}$ 21. Ln $\frac{5x^3 - 3x^2-1}{x - 4x^4}$ $_{x\to \infty}$ $_{x\to \infty}$ $_{x\to \infty}$ $_{x\to \infty}$

22. $_{x\to \infty}$ln $\frac{3-2x^4}{1+x}$ 23. $_{x\to \infty}$Ln $\frac{x^{1/3}+1}{x+1}$ 24. Ln $(\frac{1}{x-3}$ $_{x\to -1}$ $\frac{1}{|x-3|})$ $_{x\to 3}$

25. $_{x\to \infty}$f(x) = x^2 + 3 if x< 1

X+1 x>1

26. f(x) $\begin{cases} 3 & x<-2 \\ -1 & -2<x<2 \\ \frac{2}{3} & x>2 \end{cases}$ $_{x\to \infty}$

Find $\lim_{x \to t}$ $\lim_{x \to -2}$ $\lim_{x \to 2}$ & ln +-