

Worksheet on Limits

Evaluate:

1. $\lim_{x \rightarrow 2} \frac{3^{x/2} - 3}{3^x - 9}$. [Ans. = $\frac{1}{6}$]

2. $\lim_{x \rightarrow 7} \frac{2 - \sqrt{x-3}}{x^2 - 49}$. [Ans. = $\frac{-1}{56}$]

3. $\lim_{x \rightarrow 0} \left[\frac{\sqrt{a+x} - \sqrt{a-x}}{x} \right]$. [Ans. = $\frac{1}{\sqrt{a}}$]

4. $\lim_{x \rightarrow 0} \left(\frac{4^x - 1}{3^x - 1} \right)$. [Ans. = $\log_4 3$]

5. $\lim_{x \rightarrow 0} \frac{\log(3+x) - \log(3-x)}{x} = k$, find the value of k. [Ans. = $\frac{2}{3}$]

6. $\lim_{x \rightarrow b} \frac{\sqrt{x-a} - \sqrt{b-a}}{x^2 - b^2}$. [Ans. = $\frac{1}{4b\sqrt{b-a}}$]

7. $\lim_{x \rightarrow \infty} \left(\frac{x^3 + 1}{x^2 + 1} - ax - b \right) = 2$, find a and b. [Ans. = a = 1, b = - 2]