
Complete the following problems. Show all work to receive full credit.

1. Find $\lim_{x \rightarrow -0.5^-} \sqrt{\frac{x+2}{x+1}}$

$$\begin{aligned}\lim_{x \rightarrow -0.5^-} \sqrt{\frac{x+2}{x+1}} &= \sqrt{\frac{-0.5+2}{-0.5+1}} \\ &= \sqrt{3}\end{aligned}$$

2. Find $\lim_{y \rightarrow 0} \frac{\sin 3y}{4y}$

$$\begin{aligned}\lim_{y \rightarrow 0} \frac{\sin 3y}{4y} &= \lim_{y \rightarrow 0} \frac{\frac{3}{4} \sin 3y}{3y} \\ &= \frac{3}{4} \lim_{y \rightarrow 0} \frac{\sin 3y}{2y} \\ &= \frac{3}{4} \cdot 1 \\ &= \frac{3}{4}\end{aligned}$$

3. Find $\lim_{x \rightarrow \infty} \frac{x^{-1} + x^{-4}}{x^{-2} - x^{-3}}$

$$\begin{aligned}\lim_{x \rightarrow \infty} \frac{x^{-1} + x^{-4}}{x^{-2} - x^{-3}} &= \lim_{x \rightarrow \infty} \frac{(x^2)(x^{-1} + x^{-4})}{x^2(x^{-2} + x^{-3})} \\ &= \lim_{x \rightarrow \infty} \frac{x + \frac{1}{x^2}}{1 + \frac{1}{x}} \\ &= \frac{\infty}{1} \\ &= \infty\end{aligned}$$