

Find the following limits. Express your answer in exact form whenever possible (for example, if the value of the limit is π do not write 3.14).

1. $\lim_{x \rightarrow \pi} \sin(x - \pi)$

2. $\lim_{x \rightarrow \pi^+} \frac{1}{\sin(x - \pi)}$

3. $\lim_{x \rightarrow \pi^+} \frac{2x - 2\pi}{\sin(x - \pi)}$

4. $\lim_{x \rightarrow \pi^+} \sin\left(\frac{1}{x - \pi}\right)$

5. $\lim_{x \rightarrow 0} x \cdot \cot(2x)$

6. $\lim_{x \rightarrow \infty} x \cdot \ln\left(\frac{x+1}{x-1}\right)$

7. $\lim_{x \rightarrow 0^-} x^3 \cdot e^{1/x}$

8. $\lim_{x \rightarrow \infty} \left(1 + \frac{3}{x}\right)^x$

9. $\lim_{x \rightarrow \infty} (\ln x - \sqrt{x})$

10. $\lim_{x \rightarrow \infty} \frac{\sin\left(\frac{1}{x}\right)}{\ln x}$

12. $\lim_{x \rightarrow \infty} \frac{x^2}{e^{-x}}$

13. $\lim_{x \rightarrow 0^+} \frac{x^2 \cdot \sin\left(\frac{1}{x}\right)}{\sin x}$

14. $\lim_{x \rightarrow 0^+} (2^x - 1)\sqrt{x}$

15. $\lim_{x \rightarrow \infty} (\ln|2x - 4| - \ln|x + 3|)$