PRACTICE PROBLEM SET 1

Try these 22 problems to test your skill with limits.

1. $\lim_{x\to 8}\left(x^2-5x-11\right)=$

2. $\lim_{x\to 5}\left(\frac{x+3}{x^2-15}\right)=$

3. $\lim_{x\to 3}\left(\frac{x^2-2x-3}{x-3}\right)=$

4. $\lim_{x\to \infty}\left(\frac{x^4-8}{10x^2+25x+1}\right)=$

5. $\lim_{x\to \infty}\left(\frac{x^4-8}{10x^4+25x+1}\right)=$

6. $\lim_{x\to 6^+}\left(\frac{x+2}{x^2-4x-12}\right)=$

7. $\lim_{x \to 6^-} \left(\frac{x+2}{x^2 - 4x - 12} \right) =$

8. $\lim_{x \to 6} \left(\frac{x+2}{x^2 - 4x - 12} \right) =$

9. $\lim_{x \to 0^+} \left(\frac{x}{|x|} \right) =$

10. $\lim_{x \to 7^+} \left(\frac{x}{x^2 - 49} \right) =$

11. $\lim_{x \to 7} \left(\frac{x}{x^2 - 49} \right) =$

12. Let $f(x)=\begin{cases} x^2-5, & x\le 3 \\ x+2, & x>3 \end{cases}$

Find: (a) $\lim_{x\to 3^-} f(x)$; (b) $\lim_{x\to 3^+} f(x)$; and (c) $\lim_{x\to 3} f(x)$

13. Let $f(x)=\begin{cases} x^2-5, & x\le 3 \\ x+1, & x>3 \end{cases}$

Find: (a) $\lim_{x\to 3^-} f(x)$; (b) $\lim_{x\to 3^+} f(x)$; and (c) $\lim_{x\to 3} f(x)$

14. Find $\lim_{x\to \frac{\pi}{4}} 3\cos x$.

15. Find $\lim_{x\to 0} 3\dfrac{x}{\cos x}$.

16. Find $\lim_{x\to 0} 3\dfrac{x}{\sin x}$.

17. Find $\lim_{x\to 0} \dfrac{\tan 7x}{\sin 5x}$.

18. Find $\lim_{x\to \infty} \sin x$.

19. Find $\lim_{x\to\infty} \sin\frac{1}{x}$.

20. Find $\lim_{x\to 0} \frac{\sin^2 7x}{\sin^2 11x}$.

21. Find $\lim_{h\to 0} \frac{(3+h)^2 - 9}{h}$.

22. Find $\lim_{h\to 0} \frac{\frac{1}{x+h} - \frac{1}{x}}{h}$.