

1.2 Limits Analytically

Calculus

Name: _____

CA #2

Find the value of each limit. No calculator is allowed.

1. $\lim_{x \rightarrow 1} (4x - 2x^2)$	2. $\lim_{x \rightarrow 3} 1$	3. $\lim_{x \rightarrow 3} \frac{\sqrt{x+4} + 2\sqrt{7}}{x}$
4. $\lim_{x \rightarrow \frac{\pi}{4}} \sin(2x)$	5. $\lim_{x \rightarrow -5} \frac{3x^3 + 14x^2 - 5x}{x^2 + 5x}$	6. $\lim_{x \rightarrow 0} \frac{10x^2 - 3x}{x}$
7. $\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{3 - x}$	8. $\lim_{x \rightarrow 0} \frac{\sin(2x)}{5x}$	9. $\lim_{x \rightarrow 0} \frac{\sqrt{x+10} - \sqrt{10}}{x}$
10. $\lim_{x \rightarrow 0} \frac{1 - \cos(3x)}{10x}$	11. $\lim_{x \rightarrow 0} \frac{\tan(3x)}{4x}$	12. $\lim_{x \rightarrow 0} \frac{\sin^2(6x)}{9x^2}$

13. $\lim_{h \rightarrow 0} \frac{\frac{1}{2(x+h)} - \frac{1}{2x}}{h}$	14. $\lim_{h \rightarrow 0} \frac{5 - 2(x+h) - (5 - 2x)}{h}$
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If $g(x) = \begin{cases} \frac{6}{x} - \frac{x}{2}, & x < -3 \\ x^2 - \frac{12}{x}, & -3 < x < 1 \\ \sqrt{10-x}, & x \geq 1 \end{cases}$, find the following:		If $h(\theta) = \begin{cases} \frac{\sin \theta}{2}, & \theta \leq \frac{\pi}{4} \\ \tan \theta, & \frac{\pi}{4} < \theta \leq \pi \\ \cos \frac{\theta}{4}, & \theta > \pi \end{cases}$, find the following:	
15. $\lim_{x \rightarrow -3^-} g(x)$	16. $\lim_{x \rightarrow -3^+} g(x)$	19. $\lim_{\theta \rightarrow \pi^+} h(\theta)$	20. $\lim_{\theta \rightarrow \frac{\pi}{4}} h(x)$
17. $\lim_{x \rightarrow -3} g(x)$	18. $\lim_{x \rightarrow 1} g(x)$	21. $\lim_{\theta \rightarrow \pi^-} h(\theta)$	22. $\lim_{\theta \rightarrow \frac{\pi}{4}^+} h(x)$

Answers to 1.2 CA #2

1. 2	2. 1	3. $\sqrt{7}$	4. 1	5. -16	6. -3	7. -5
8. $\frac{2}{5}$	9. $\frac{\sqrt{10}}{20}$	10. 0	11. $\frac{3}{4}$	12. 4	13. $-\frac{1}{2x^2}$	14. -2
15. $-\frac{1}{2}$	16. 13	17. DNE	18. DNE	19. $\frac{\sqrt{2}}{2}$	20. $\frac{\sqrt{2}}{4}$	22. 1
				21. 0		