1.2 Limits Analytically

Calculus Name: _____ **CA #1**

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

1. $\lim_{x\to -3}(2x^2+x-5)$

2. $\lim_{x\to 5}\sqrt{3x-11}$

3. $\lim_{x\to 0}(-5)$

4. $\lim_{x\to -1}\dfrac{x^2-3x+9}{x}$

5. $\lim_{x\to 2}\dfrac{x^2+3x}{x-2}$

6. $\lim_{x\to -3}\dfrac{2x^2+7x+3}{x+3}$

7. $\lim_{x\to 7}\dfrac{-x^2+13x-42}{x-7}$

8. $\lim_{x\to 13}\dfrac{\sqrt{x+12}-5}{x-13}$

9. $\lim_{x\to 0}\dfrac{\sin(4x)}{3x}$

10. $\lim_{x\to 0}\dfrac{\tan(2x)}{2x}$

11. $\lim_{x\to 0}\dfrac{1-\cos(4x)}{2x}$

12. $\lim_{x\to 0}\dfrac{\sin^2(5x)}{4x^2}$

13. $\lim_{x\to 0}\dfrac{\dfrac{1}{x+2}-\dfrac{1}{2}}{x}$

14. $\lim_{h\to 0}\dfrac{2(x+h)^2-4(x+h)-(2x^2-4x)}{h}$

If $g(x)=\begin{cases}\frac{5}{x}-\frac{x}{2}, & x<-5\\ x^2-\frac{6}{x} & -5\le x<2\\ \sqrt{3-x}, & x\ge 2\end{cases}$, find the following:

15. $\lim_{x\to -5^-} g(x)$

16. $\lim_{x\to -5^+} g(x)$

17. $\lim_{x\to -5} g(x)$

18. $\lim_{x\to 2} g(x)$

If $h(\theta)=\begin{cases}\cos 2\theta, & \theta<\frac{\pi}{2}\\ \frac{\tan\theta}{2}, & \frac{\pi}{2}<\theta\le\pi\\ \sin\frac{\theta}{2}, & \theta\ge\pi\end{cases}$, find the following:

19. $\lim_{\theta\to\pi^+} h(\theta)$

20. $\lim_{\theta\to\frac{\pi}{2}^-} h(x)$

21. $\lim_{\theta\to\frac{\pi}{2}} h(\theta)$

22. $\lim_{\theta\to\pi} h(x)$

Answers to 1.2 CA #1

1. 10	2. 2	3. -5	4. -13	5. Does not exist		6. -5	7. -1
8. $\frac{1}{10}$	9. $\frac{4}{3}$	10. 1	11. 0	12. $\frac{25}{4}$	13. $-\frac{1}{4}$	14. $4x-4$	15. $\frac{3}{2}$
16. $26\frac{1}{5}$	17. DNE	18. 1	19. 1	20. -1	21. DNE	22. DNE	