Calculus
Limits of Trig Functions

Name_____Pd._____
Limits, Cont., & R.O.C Day 8

1. $\lim_{x\to 0}\frac{\sin x}{5x}$

2. $\lim_{x\to 0}\frac{3(1-\cos x)}{x}$

3. $\lim_{x\to 0}\sin\frac{\pi x}{2}$

4. $\lim_{x\to \frac{\pi}{2}^-}\tan x$

5. $\lim_{x\to \pi}\cos 3x$

6. $\lim_{\theta\to 0}\frac{\sec\theta-1}{\theta\sec\theta}$

7. $\lim_{x\to 0}\frac{\cos x\tan x}{x}$

8. $\lim_{\theta\to \infty}\cos 2\theta$

9. $\lim_{x\to 0}\cos\frac{1}{x}$

10. $\lim_{x\to \infty}\sin x$

11. $\lim_{x\to 0}\frac{\tan^2 x}{x}$

12. $\lim_{x\to \pi} x\sec x$

13. $\lim_{x\to \frac{\pi}{2}}\frac{\cos x}{\cot x}$

14. $\lim_{x\to 0}\frac{\sin^2 x}{x^2}$

Intermediate Value Theorem

14. Suppose $f(x)=x^3+5$.

a.) Show that $f(c)=13$ for some c on the interval $(-1,3)$. Find the value(s) of c.

b.) Use IVT to verify that there is a root for $f(x)$ on the interval $(-2,1)$.

Suppose the function h is continuous for all real numbers. Use the tale below to answer the following questions.

x	0	1	2	3	4	5
$h(x)$	-12	-8	-7	1	3	-2

a.) Suppose $g(x)=3h(x)-6$. Show that there must be a value n for $3<n<4$ such that $g(n)=0$.

b.) What is the fewest number of x-values for which h must equal 0? Explain your reasoning.

Answers:

1.) $\frac{1}{5}$	2.) 0	3.) 0	4.) ∞	5.) -1	6.) 0	7.) 1
8.) dne	9.) dne	10.) dne	11.) 0	12.) $-\pi$	13.) 1	14.) 1