

Review Worksheet # 1

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| 1. Show that $f(x)$ is even. | |
| 2. Show that $f(x)$ is odd. | |
| 3. Show that $\lim_{x \rightarrow a} f(x)$ exists. | |
| 4. Explain the continuity test. | |
| 5. Given a piecewise function $F(x) \begin{cases} G(x) & \text{when } x < a \\ H(x) & \text{when } x \geq a \end{cases}$ Show that $F(x)$ is continuous at $x = a$. | |
| 6. Same as 5. Show that $F(x)$ is differentiable at $x = a$. | |
| 7. A function is continuous but not differentiable when _____ | |
| 8. Explain IVT. State conditions. | |
| 9. Explain MVT. State conditions. | |
| 10. Explain EVT. State conditions. | |
| 11. Does continuity imply differentiability? How about vice versa? | |
| 12. Given $f(x)$ is twice differentiable. If $f(2) = 6$ and $f(7) = 10$, there must be a value of c , where $2 < c < 7$, for which a) MVT guarantees what? b) IVT guarantees what? | |
| 13. If $f(x)$ is continuous $[2,8]$ and differentiable $(2,8)$, then $f(x)$ must have a _____ and a _____ in $[a,b]$. What theorem guarantees that? | |
| 14. Explain Rolle's Theorem with an example. | |

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| 15. Give 2 definitions of the derivative by using limits. | |
| 16. How do you find a horizontal asymptote of $f(x)$ by using limits? | |
| 17. If $f(x) = g(x)/h(x)$ then explain how you find $\lim f(x)$ when x goes to infinity by using degree analysis. | |
| 18. Same $f(x)$ as 17. If $\lim f(x)$ as x goes to a is $0/0$, what can you do to compute the limit? (2 methods) | |
| 19. What are the restrictions on domain for radical and rational functions? | |
| 20. Find the domain of $f(x) = \frac{\sqrt{1-4x^2}}{x+3}$. | |
| 21. $\lim_{h \rightarrow 0} \frac{\ln(e+h)-1}{h} =$ Explain how you find the limit. Find the limit. | |
| 22. If $\lim_{x \rightarrow a} f(x) = L$, then $f(x)$ must be continuous, differentiable or neither? Explain. | |