

MATH 161 EXAM 1, Fall 2003

Show all work!		Name:	Score	
1.	The displacement of a particle is given by $s = 4t^2$ . Find the average velocity in the interval: a) $[1, 3]$	b) $[1, 1.2]$	1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
2.	Guess the limit. Write one sentence explaining how you obtained your answer. a) $\lim_{x \rightarrow 0} (\sin x)/x$	b) $\lim_{x \rightarrow 0} (x \ln x)$	9	
			10	
			Tot	
Ans:_____.		Ans:_____.		
3.	Determine the infinite limit: a) $\lim_{x \rightarrow 5^+} \frac{2}{x-5}$	b) $\lim_{x \rightarrow \infty} \frac{3x^3 - 8}{2 + x - 5x^3}$	Ans:_____.	
			Ans:_____.	
4.	Evaluate the limit and justify every step using the Limit Law(s). a) $\lim_{x \rightarrow 3} (2x^2 - 5)$ .	b) $\lim_{x \rightarrow 5^-} \sqrt{25 - x^2}$ .	Ans:_____.	
			Ans:_____.	
5.	Evaluate the limit, if it exists: a) $\lim_{x \rightarrow 3} \frac{x^2 - 3x}{x^2 + 2x - 15}$ .	b) $\lim_{h \rightarrow 0} \frac{(1+h)^2 - 1}{h}$ .	Ans:_____.	
			Ans:_____.	
Extra Space				

6.	Using the $\epsilon, \delta$ definition, prove that: $\lim_{x \rightarrow 10} (4 - x/5) = 2$
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7.	a) Define precisely what is meant by a continuous function.	b) Is $f(x)$ continuous at $x = 2$ ?, Explain!
		$f(x) = \begin{cases} x + 2 & x \leq 2 \\ x^2 & x > 2 \end{cases}$

8.	Use a limit method to find the slope of the tangent line to $f(x)$ at the point $(4, 1)$ .
	$f(x) = \frac{6}{x+2}$
	Ans: _____

9.	The price $P(t)$ per share of a stock for 9 consecutive days is given by:																					
	<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">t</td> <td style="padding: 2px 5px;">1</td> <td style="padding: 2px 5px;">2</td> <td style="padding: 2px 5px;">3</td> <td style="padding: 2px 5px;">4</td> <td style="padding: 2px 5px;">5</td> <td style="padding: 2px 5px;">6</td> <td style="padding: 2px 5px;">7</td> <td style="padding: 2px 5px;">8</td> <td style="padding: 2px 5px;">9</td> </tr> <tr> <td style="padding: 2px 5px;">P</td> <td style="padding: 2px 5px;">2.28</td> <td style="padding: 2px 5px;">4.31</td> <td style="padding: 2px 5px;">5.80</td> <td style="padding: 2px 5px;">8.12</td> <td style="padding: 2px 5px;">10.44</td> <td style="padding: 2px 5px;">11.31</td> <td style="padding: 2px 5px;">13.97</td> <td style="padding: 2px 5px;">15.01</td> <td style="padding: 2px 5px;">17.64</td> </tr> </table>		t	1	2	3	4	5	6	7	8	9	P	2.28	4.31	5.80	8.12	10.44	11.31	13.97	15.01	17.64
t	1	2	3	4	5	6	7	8	9													
P	2.28	4.31	5.80	8.12	10.44	11.31	13.97	15.01	17.64													
	a) Estimate the value of $P'(5)$ .	b) What is the meaning of this value.																				
	Ans: _____.	Ans: _____.																				

10.	Use the limit definition to find the derivative of $f(x) = \sqrt{x}$
	Ans: _____.

	Extra Space
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