

University of Connecticut Department of Mathematics

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Матн 1131	Practice Exam 1	Fall Voluments 2018				
NAME: Solut	ims					
SIGNATURE:						
Instructor Name:		Lecture Section:				
TA Name:		Discussion Section:				

Read This First!

- Please read each question carefully. All questions are multiple choice. There is only one correct choice for each answer. Each question is one point.
- Indicate your answers on the answer sheet. The answer sheet is the **ONLY** place that counts as your official answers.
 - (1) When you're done, hand in **both** the exam booklet and the answer sheet.

(2) You will receive the exam booklet back after the exam is graded. The booklet is not graded, but you may circle answers there for your records.

• Calculators are allowed **below the level of TI-89**. In particular, the **TI-Nspire is not** allowed. No books or other references are permitted.

1. The distance traveled by a particle in t seconds is given by $s(t) = t^2 + 3t$. What is the particle's [1] average velocity over the interval $1 \le t \le 4$?

$$\underbrace{(A) \otimes (B) \otimes (C) 2}_{(D) 5 \otimes (E) - 1} = \left(\frac{|b| + |2|}{3} - (1 + 3) \right)$$
$$= \frac{2 \otimes -4}{3} = \frac{2 \times 4}{3} = 8$$

2. Evaluate the following limit:

$$\lim_{x \to 1^-} \frac{x-3}{x-1}.$$

$$(A) 2 (B) -2 (C) -1$$

$$(B) +\infty (E) -\infty$$

$$(A) 2 (B) -2 (C) -1$$

$$(B) +\infty (E) -\infty$$

$$(A) 2 (B) -2 (C) -1$$

$$(C) -1$$

$$(E) -\infty$$

$$(C) -1$$

$$(C$$

[1]

3. Using the table below, what appears to be the value of the limit

	x	1.9	1.99	1.999	1.9999	2	2.0001	2.001	2.01	2.1	
	f(x)	3	7	291	4081	?	-9532	-112	-17	-1	
B	(A) ∞ (B) $-\infty$ (C) 0 (D) -1000 (E) None of the above. Jetting Smaller towards $-\infty$										

 $\lim_{x \to 2^+} f(x)$

mult: $\lim_{x \to 4} \frac{x^2 - 8x + 16}{x - 4} = \frac{16 - 32 + 16}{6} = \frac{16}{6} \int_{C}^{[1]} \int_{$ 6. Evaluate the following limit: (A) 0

 $\int 2f(x) = \sqrt{1(x)}$

7. If
$$\lim_{x \to 1} f(x) = 3$$
, $\lim_{x \to 1} g(x) = -2$, and $\lim_{x \to 1} h(x) = 4$, evaluate the limit

$$\lim_{x \to 1} \left(\frac{g(x)}{g(x)} + \sqrt{h(x)} \right)^{-1}$$

$$\lim_{x \to 1} (B) = 3 \quad (C) = 13$$

$$\lim_{x \to 1} \frac{2f(x)}{g(x)} + \sqrt{h(x)} = \frac{2\lim_{x \to 1} f(x)}{|x| + \sqrt{1 + h(x)}} + \sqrt{\lim_{x \to 1} h(x)}$$

$$= \frac{2(3)}{-2} + \sqrt{4}$$

$$= -3 + 2 = -1$$

8. When showing $\lim_{x \to 2} (5x + 1) = 11$ by the $\varepsilon - \delta$ definition of limits, which of the following is an acceptable value for δ when $\varepsilon = 0.01$? (A) 0.05 (B) 0.5 (C) 0.1 (D) 0.02 (E) 0.001 (E) 0.001

9. Determine the value of the number k that makes the function f(x) below continuous:

X-2 < . 60)

$$f(x) = \begin{cases} 1 - kx & \text{if } x < 1, \\ k + x & \text{if } x \ge 1. \end{cases}$$

$$(A) 0 \quad (B) 1 \quad (C) -3/4$$

$$(D) 1/2 \quad (E) 15/17$$

$$(C) -3/4$$

[1]

[1]

10. Consider the function



11. If the function f(x) is continuous on the interval [-1,3], f(-1) = 1, and f(3) = 11, which [1]numbers below are guaranteed to be values of f(x) by the Intermediate Value Theorem on the interval (-1,3)?



12. Evaluate the following limit:

$$\lim_{x \to \infty} \frac{\sqrt{x^2 + 2}}{x}.$$
(A) +\infty (B) -\infty (C) 0

(D) 1
(E) -1

$$\lim_{x \to \infty} \sqrt{\chi^2 + 2} = \lim_{x \to \infty} \sqrt{1 + \frac{2}{32}} = \sqrt{1} = 1$$

15. If we want to calculate the derivative f'(x) of f(x) = 3x + 4 using the limit definition of the [1] derivative which of the following limits do we need to evaluate and to what does the limit evaluate?

$$(A) \lim_{h \to 0} \frac{3(x+h) + 4 - (3x+4)}{h} = 3$$

$$(B) \lim_{h \to 0} \frac{3(x+h) + 4 - (3x+4)}{h} = 0$$

$$(C) \lim_{h \to 0} \frac{3h + 4 - (3x+4)}{h} = 3x + 3$$

$$(D) \lim_{h \to 0} \frac{3(x+h) + 4 - (3h+4)}{h} = 3$$

$$(E) \text{ None of the above.}$$

$$= \lim_{h \to 0} \frac{3(x+h) + 4 - (3h+4)}{h} = 3$$

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$$= \lim_{h \to 0} \frac{3(x+h) + 4 - (3x+4)}{h} = 3$$

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16. Below is the graph of the derivative g'(x) of a function g(x).

yS devivative O Og'(x). 1.5, 04 - 1.5So slope Othere. -2-1 Figure 1: Graph of g'(x). Which of the following is a possible graph of g(x)? (A)(B) no O Sloge at -1.5 $\rightarrow x$ 0 0 6 slope wion (C)(D) no zerro Sloge at right spots $\dot{2}$ -2 -1 $\mathbf{2}$ $^{-1}$ 0 1 (1 (E) None of the above. It looks like: inegateire : posite pasive Slope VL a , 6 2 (Page 8 of 8

17. For what value of the number k is the following function differentiable at x = 0?

