

- To use this as a practice quiz, you should have studied the problem banks in advance.
- Put away all material and set a timer for 10 minutes. (You will have 10 minutes for this quiz in class.)
- Go to your math mentors study hours to check your answers.

Practice Quiz: Critical Points, Fall 2017

Version: 3

Name (Print): \_\_\_\_\_ RIN: \_\_\_\_\_

Math Mentor Name: \_\_\_\_\_

**Rules:** Notes, calculators, cell phones and headphones are not allowed.

**Honor Code Pledge:** I did not violate any rules on this quiz and have no knowledge of any other student violating rules on this quiz. \_\_\_\_\_ (Signature)

**Instructions:** Put your final answer in the box shown. No partial credit will be given and nothing outside the box will be graded.

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1. Find all the critical points of  $f(x) = \frac{1}{3}x^3 + \frac{5}{2}x^2 - 24x + \sin(\ln(2))$ , if any. Express your answer(s) in simplified form.

2. Find all the critical points of  $f(x) = (x - 9)^2(3x + 8)$ , if any. Express your answer(s) in simplified form.

3. Find all the positive critical points of  $f(x) = 2x^2 + \frac{7}{x}$ , if any. Express your answer(s) in simplified form.

4. Suppose the twice differentiable function has derivatives with signs as in the chart below. State the interval(s) on which  $f$  is increasing.

	$x < 2$	$2 < x < 5$	$5 < x < 10$	$10 < x$
$f'(x)$	+	-	-	+
$f''(x)$	-	-	+	+

5. Find all the critical points of  $f(x) = \frac{x+2}{x^2+45}$ , if any. Express your answer(s) in simplified form.