

Name _____ ID # _____ Section # _____

There are 8 multiple-choice questions, 8 True/False questions, and 4 partial credit questions. For the partial credit problems you **must present your work clearly and understandably; no credit will be given for unsupported answers.** For True/False and multiple-choice problems, please circle the correct answer in each question.

THE USE OF CALCULATORS IS NOT PERMITTED IN THIS EXAMINATION.

THERE ARE 13 PROBLEMS ON 10 PAGES, INCLUDING THIS ONE.
CHECK YOUR BOOKLET NOW.

The area below is for the instructor's use.

MC (40)
T/F (16)
10 (8)
11 (14)
12 (12)
13 (10)
Total (100)

1. (5 pts.) The slope of the line tangent to the graph given by $y^3 - x^3 = 9$, at the point $(-1, 2)$ is

- a) $\frac{1}{4}$
- b) 0
- c) $-\frac{1}{2}$
- d) -4
- e) The tangent line does not exist at this point.

2. (5 pts.) Suppose $x = \cot y$, find $\frac{dy}{dx}$.

- a) $x^2 - 1$
- b) $\frac{1}{\sqrt{1+x^2}}$
- c) $\frac{1}{\sqrt{1-x^2}}$
- d) $\frac{-1}{1+x^2}$
- e) $\frac{-1}{x\sqrt{x^2-1}}$

3. (5 pts.) The graph of $y = x^2 + \frac{1}{x^2}$ has

- a) Local maximums at $x = -1$ and $x = 1$, no local minimums.
- b) Local maximum at $x = -1$, local minimum at $x = 1$.
- c) No local maximums, local minimums at $x = -1$ and $x = 1$.
- d) Local maximum at $x = 0$, local minimums at $x = -1$ and $x = 1$.
- e) Local maximums at $x = -1$ and $x = 1$, local minimum at $x = 0$.

4. (5 pts.) On the interval $[0, \pi]$, what is the critical point(s) of $f(x) = \sin(x) \cos(x)$?

- a) $x = 0$
- b) $x = \frac{\pi}{2}$ and $x = \pi$
- c) $x = \frac{\pi}{4}$ and $x = \frac{3\pi}{4}$
- d) $x = \frac{\pi}{4}$ and $x = \frac{\pi}{2}$
- e) $x = 0$, $x = \frac{\pi}{2}$, and $x = \pi$