

Name _____ ID # _____ Section # _____

There are 12 multiple-choice questions, 9 True/False questions, and 2 partial credit / short answer questions. For the partial credit problems you **must** present your work clearly and understandably; no credit will be given for unsupported answers. For each multiple-choice problem **five** possible answers are given, only one of which is correct. **Circle** the correct answer in your exam booklet **and blacken** the corresponding space on the **scantron form**. Mark only one choice; darken the circle completely (you should not be able to see the letter after you have darkened the circle). For True/False problems, please circle the correct answer in each question.

<p>THE USE OF CALCULATORS IS NOT PERMITTED IN THIS EXAMINATION.</p>
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<p>THERE ARE 15 PROBLEMS ON 10 PAGES, INCLUDING THIS ONE. CHECK YOUR BOOKLET NOW.</p>
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The area below is for the instructor's use.

MC (60)

T/F (18)

14 (10)

15 (12)

Total (100)

1. (5 pts.) A polynomial function always has all the properties listed below, EXCEPT

- a) Its domain is $(-\infty, \infty)$.
- b) It is continuous everywhere.
- c) Its graph has exactly one y -intercept.
- d) Its graph does not have any vertical asymptote.
- e) Its range is $(-\infty, \infty)$.

2. (5 pts.) Suppose $f(x) = x^3 + 1$ and $h \neq 0$, find the difference quotient $\frac{f(x+h) - f(x)}{h}$.

- a) $3x^2 + 3hx + h^2$
- b) $3x^2$
- c) $\frac{x^3 + 3hx^2 + 3h^2x + h^3}{h}$
- d) h^2
- e) $\frac{1}{h}$

3. (5 pts.) $\lim_{x \rightarrow 3} \frac{x^2 + x - 12}{x^2 - 5x + 6} =$

- a) 7
- b) 0
- c) 1
- d) $+\infty$
- e) $-\infty$

4. (5 pts.) $\lim_{x \rightarrow 1^-} \frac{x + 3}{x^2(x - 1)} =$

- a) 0
- b) 3
- c) 4
- d) $-\infty$
- e) $+\infty$