

Do not remove this answer page — you will turn in the entire exam. You have two hours to do this exam. No books or notes may be used. You may use a graphing calculator during the exam, but NO calculator with a Computer Algebra System (CAS) or a QWERTY keyboard is permitted. Absolutely no cell phone use during the exam is allowed.

The exam consists of multiple choice questions. Record your answers on this page. For each multiple choice question, you will need to fill in the box corresponding to the correct answer. For example, if (b) is correct, you must write

a b c d e

Do not circle answers on this page, but please circle the letter of each correct response in the body of the exam. It is your responsibility to make it CLEAR which response has been chosen. You will not get credit unless the correct answer has been marked on both this page and in the body of the exam.

GOOD LUCK!

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|---|---|
| 1. <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e | 11. <input checked="" type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e |
| 2. <input checked="" type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e | 12. <input checked="" type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e |
| 3. <input type="checkbox"/> a <input type="checkbox"/> b <input checked="" type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e | 13. <input checked="" type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e |
| 4. <input checked="" type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e | 14. <input type="checkbox"/> a <input type="checkbox"/> b <input checked="" type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e |
| 5. <input checked="" type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e | 15. <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input checked="" type="checkbox"/> e |
| 6. <input type="checkbox"/> a <input type="checkbox"/> b <input checked="" type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e | 16. <input type="checkbox"/> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e |
| 7. <input type="checkbox"/> a <input type="checkbox"/> b <input checked="" type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e | 17. <input type="checkbox"/> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e |
| 8. <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e | 18. <input type="checkbox"/> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e |
| 9. <input type="checkbox"/> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e | 19. <input type="checkbox"/> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e |
| 10. <input type="checkbox"/> a <input type="checkbox"/> b <input checked="" type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e | 20. <input checked="" type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e |

For grading use:

| | |
|----------------|----------------------|
| Number Correct | |
| | (out of 20 problems) |

| | |
|-------|---------------------|
| Total | |
| | (out of 100 points) |

Please make sure to list the correct section number on the front page of your exam. In case you forgot your section number, consult the following table. If you are enrolled in a lecture with recitation, then your section number is determined by your recitation time and location.

| Section # | Instructor | Lectures |
|-----------|-------------|----------------------------------|
| 001 | T. Chapman | MWF 8:00 am - 8:50 am, CB 118 |
| 002 | D. Leep | MWF 12:00 pm - 12:50 pm, KAS 213 |
| 003 | M. Shaw | TR 8:00 am - 9:15 am, CP 155 |
| 004 | J. Schmidt | TR 12:30 am- 1:45 am, CP 155 |
| 005 | M. Music | T 3:30 pm - 4:45 pm, CP 345 |
| 006 | M. Music | R 3:30 pm - 4:45 pm, CP 208 |
| 007 | W. Robinson | T 3:30 pm - 4:45 pm, CP 208 |
| 008 | W. Robinson | R 3:30 pm - 4:45 pm, CB 204 |
| 009 | M. Music | T 12:30 pm - 1:45 pm, NURS 214 |
| 010 | W. Robinson | R 12:30 pm - 1:45 pm, NURS 504 |
| 011 | S. Taylor | T 9:30 am - 10:45 am, BE 248 |
| 012 | S. Taylor | R 9:30 am - 10:45 am, CB 214 |
| 013 | B. Fox | T 9:30 am - 10:45 am, MMRB 243 |
| 014 | B. Fox | T 9:30 am - 10:45 am, FB B3 |
| 015 | C. Taylor | T 11:00 am - 12:15 pm, CB 347 |
| 016 | B. Fox | T 11:00 am - 12:15 pm, CB 243 |
| 017 | C. Taylor | T 2:00 pm - 3:15 pm, NURS 511 |
| 018 | C. Taylor | R 2:00 pm - 3:15 pm, DH 323 |
| 019 | G. Tiser | T 2:00 pm - 3:15 pm, CB 213 |
| 020 | S. Taylor | R 2:00 pm - 3:15 pm, FB B8 |
| 021 | G. Tiser | T 12:30 pm - 1:45 pm, FPAT 255 |
| 022 | G. Tiser | R 12:30 pm - 1:45 pm, DH 323 |
| 401 | S. Foege | TR 6:00 pm-7:15 pm, CB 347 |
| 402 | S. Foege | TR 7:30 pm-8:45 pm, CB 347 |

Multiple Choice Questions

*Show all your work on the page where the question appears.
Clearly mark your answer both on the cover page on this exam
and in the corresponding questions that follow.*

1. Suppose that the derivative $f'(x) > 0$ for all x in the interval $(2, 8)$. Which statement is definitely true?

Possibilities:

- (a) $f(x)$ is decreasing on the interval $(2, 8)$.
 - (b) $f(x)$ is concave down on the interval $(2, 8)$.
 - (c) $f(x)$ is concave up on the interval $(2, 8)$.
 - (d) $f(x)$ is increasing on the interval $(2, 8)$.
 - (e) The graph of $f(x)$ must be above the x -axis on the interval $(2, 8)$.
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2. Suppose that the derivative of $g(t)$ is $g'(t) = (t - 5)(t - 9)(t - 13)$. Find the value of t in the interval $[5, 13]$ where $g(t)$ has its maximum.

Possibilities:

- (a) $t = 9$
 - (b) $t = 7$
 - (c) $t = 6$
 - (d) $t = 5$
 - (e) $t = 13$
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3. Find the largest interval on which $f(x) = x^4 - 6x^3 - 60x^2 - x + 5$ is concave down.

Possibilities:

- (a) $(-2, 7)$
 - (b) $(-2, 6)$
 - (c) $(-2, 5)$
 - (d) $(-2, 8)$
 - (e) $(-2, 4)$
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