

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 (a) is correct, you must write



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!

- | | | | | | | | | | | | |
|-----|-------------------------------------|----------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-----|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input checked="" type="checkbox"/> | <input type="checkbox"/> d | <input type="checkbox"/> e | 11. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input checked="" type="checkbox"/> | <input type="checkbox"/> e |
| 2. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input checked="" type="checkbox"/> | <input type="checkbox"/> e | 12. | <input type="checkbox"/> a | <input checked="" type="checkbox"/> | <input type="checkbox"/> c | <input type="checkbox"/> d | <input type="checkbox"/> e |
| 3. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input checked="" type="checkbox"/> | <input type="checkbox"/> e | 13. | <input checked="" type="checkbox"/> | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d | <input type="checkbox"/> e |
| 4. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input checked="" type="checkbox"/> | <input type="checkbox"/> d | <input type="checkbox"/> e | 14. | <input type="checkbox"/> a | <input checked="" type="checkbox"/> | <input type="checkbox"/> c | <input type="checkbox"/> d | <input type="checkbox"/> e |
| 5. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d | <input checked="" type="checkbox"/> | 15. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input checked="" type="checkbox"/> | <input type="checkbox"/> e |
| 6. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d | <input checked="" type="checkbox"/> | 16. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input checked="" type="checkbox"/> | <input type="checkbox"/> d | <input type="checkbox"/> e |
| 7. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input checked="" type="checkbox"/> | <input type="checkbox"/> e | 17. | <input checked="" type="checkbox"/> | <input 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"/> | <input type="checkbox"/> e | 18. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input checked="" type="checkbox"/> | <input type="checkbox"/> e |
| 9. | <input checked="" type="checkbox"/> | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d | <input type="checkbox"/> e | 19. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d | <input checked="" type="checkbox"/> |
| 10. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input checked="" type="checkbox"/> | <input type="checkbox"/> e | 20. | <input checked="" type="checkbox"/> | <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 time and location is based on your recitation, not your lecture.

Section #	Instructor	Lectures
001	Koester/Hamilton	T 8:00 - 9:15 am, CP 243
002	Koester/Hamilton	R 8:00 - 9:15 am, CP 243
003	Koester/Hamilton	T 9:30 - 10:45 am, MMRB 243
004	Koester/May	R 9:30 - 10:45 am, CB 342
005	Koester/May	T 11:00 - 12:15 pm, CP 220
006	Koester/May	R 11:30 - 12:15 pm, CP 220
007	Koester/Kyriopoulos	T 9:30 - 10:45 am, CP 367
008	Koester/Kyriopoulos	R 9:30 - 10:45 am, DH 323
009	Koester/Kyriopoulos	T 11:00 - 12:15 pm, FB 307A
010	Koester/Robinson	R 11:00 - 12:15 pm, CP 345
011	Koester/Robinson	T 12:30 - 1:45pm, CB 219
012	Koester/Robinson	R 12:30 - 1:45pm, CB 219
013	Shaw/Taylor	T 11:00 - 12:15 pm, CB 345
014	Shaw/Taylor	R 11:00 - 12:15 pm, MMRB 243
015	Shaw/Taylor	T 12:30 - 1:45 pm, Nurs 201
016	Shaw/Tarr	R 12:30 - 1:45 pm, Nurs 502A
017	Shaw/Tarr	T 2:00 - 3:15 pm, CB 233
018	Shaw/Tarr	R 2:00 - 3:15 pm, CB 245
019	Shaw/Ozbek	T 3:30 - 4:45pm, CP 208
020	Shaw/Ozbek	R 3:30 - 4:45 pm, CP 208
021	Shaw/Ozbek	T 2:00 - 3:15 pm, FB B2
022	Shaw/Zhi	R 2:00 - 3:15 pm, CP 233
023	Shaw/Zhi	T 9:30 - 10:45 am, CP 211
024	Shaw/Zhi	R 9:30 - 10:45 am, CB 341
025	Beth Kelly	MWF 12:00 - 12:50 pm, CP 153
026	John Maki	MWF 2:00 - 2:50 pm, KAS 213

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. The equation of the tangent line to $y = f(x)$ at $x = 8$ is $y - 5 = 6(x - 8)$. Determine $f'(8)$.

Possibilities:

- (a) 5
- (b) -43
- (c) 6**
- (d) 8
- (e) 53

$f'(8) = \text{slope of tangent line at } x = 8,$

So $f'(8) = 6$

2. $f(x) = (x - 2)^2$. Find the value of C , given that

$$\frac{f(x+h) - f(x)}{h} = Ax + Bh + C$$

Difference of Squares

Possibilities:

- (a) -7
- (b) -6
- (c) -5
- (d) -4**
- (e) -3

$$\begin{aligned} &= \frac{(x+h-2)^2 - (x-2)^2}{h} = \frac{((x+h-2) + (x-2))((x+h-2) - (x-2))}{h} \\ &= \frac{(2x+h-4)h}{h} = 2x + h - 4 \end{aligned}$$

C

3. Suppose that

$$\frac{f(x+h) - f(x)}{h} = \frac{7hx^2 - 10h^2}{h}$$

Find the derivative, $f'(3)$.

Possibilities:

- (a) 0
- (b) 7
- (c) $63 - 10h$
- (d) 63**
- (e) The derivative does not exist.

$$\begin{aligned} f'(3) &= \lim_{h \rightarrow 0} \frac{f(3+h) - f(3)}{h} \\ &= \lim_{h \rightarrow 0} \frac{7 \cdot h \cdot 3^2 - 10 \cdot h^2}{h} = \lim_{h \rightarrow 0} \frac{(63 - 10h)h}{h} \\ &= \lim_{h \rightarrow 0} (63 - 10h) = 63 \end{aligned}$$