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!

1. a b c d e		11. a b c d e
2. a b c d e		12. a b c d e
3. a b c d e		13. a b c d e
4. a b c d e		14. a b c d e
5. a b c d e		15. a b c d e
6. a b c d e		16. a b c d e
7. a b c d e		17. a b c d e
8. a b c d e		18. a b c d e
9. a b c d e		19. a b c d e
10. a b c d e		20. a b c d 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. Your section number is determined by your recitation time and location.

Section #	Instructor	Recitation
001	D. Akers	T 8:00 am - 9:15 am, CB 243
002	D. Akers	R 8:00 am - 9:15 am, CB 243
003	D. Akers	T 12:30 pm - 1:45 pm, TEB 231
004	Q. Liang	R 9:30 am - 10:45 am, NURS 502A
005	Q. Liang	T 11:00 am - 12:15 pm, CB 243
006	Q. Liang	R 11:00 am - 12:15 pm, CB 243
007	D. Corral	T 2:00 pm - 3:15 pm, DH 301
008	D. Corral	R 2:00 pm - 3:15 pm, DH 301
009	D. Corral	T 11:00 am - 12:15 pm, DH 353
010	A. Barra	R 11:00 am - 12:15 pm, DH 353
011	A. Barra	T 12:30 pm - 1:45 pm, MMRB 243
012	A. Barra	R 12:30 pm - 1:45 pm, MMRB 243
013	J. Jung	T 11:00 am - 12:15 pm, TPC 113
014	J. Jung	R 11:00 am - 12:15 pm, TPC 113
015	F. Camacho	T 12:30 pm - 1:45 pm, CB 219
016	J. Jung	R 12:30 pm - 1:45 pm, CB 219
017	F. Camacho	T 2:00 pm - 3:15 pm, FB B8
018	F. Camacho	R 2:00 pm - 3:15 pm, TPC 212
019	S. Hamilton	T 3:30 pm - 4:45 pm, CP 345
020	S. Hamilton	R 3:30 pm - 4:45 pm, BE 301
021	S. Hamilton	T 2:00 pm - 3:15 pm, CB 340
022	J. Constable	R 2:00 pm - 3:15 pm, CB 345
023	J. Constable	T 9:30 am - 10:45 am, L 201
024	J. Constable	R 9:30 am - 10:45 am, L 201
025	M. Shaw	MWF 9:00 am - 9:50 am, CB 110

You may use the following formula for the derivative of a quadratic function.

$$\text{If} \quad p(x) = Ax^2 + Bx + C, \quad \text{then} \quad p'(x) = 2Ax + B.$$

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 owner of a coffee shop decides to sell a blend of her two most popular types of coffee. The premium roast costs $10.50 per pound and the classic roast costs $6.50 per pound. How many pounds of the premium roast should she include in the blend if she wants 20 pounds of the blend and she wants to sell the blend for $8.50 per pound?

   Possibilities:

   (a) 7 pounds of the premium roast
   (b) 8 pounds of the premium roast
   (c) 9 pounds of the premium roast
   (d) 10 pounds of the premium roast
   (e) None of the above

2. Determine the equation of the line that passes through the points $(2, -3)$ and $(4, -4)$. Write the line in $y = mx + b$ form.

   Possibilities:

   (a) $y = -(1/2)x - 2$
   (b) $y = -(1/2)x + 2$
   (c) $y = (1/2)x + 2$
   (d) $y = (1/2)x - 2$
   (e) $y = -(1/2)x + 4$

3. Determine $f(1)$, given

$$f(x) = \begin{cases} -x, & \text{for } x \leq 2 \\ 4x + 5, & \text{for } x > 2 \end{cases}$$

   Possibilities:

   (a) 0
   (b) 2
   (c) 1
   (d) 9
   (e) -1

4. Solve the equation $x^3 + 4xy + 5y = 8$ for y in terms of x

Possibilities:

(a) $y = \dfrac{8 - x^3}{4x + 5}$

(b) $y = 8 - x^3 - 4x - 5$

(c) $y = \dfrac{4x + 5}{x^3 - 8}$

(d) $y = \dfrac{4x + 5}{8 - x^3}$

(e) $y = \dfrac{x^3 - 8}{4x + 5}$

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5. The line $y = x$ intersects the curve $y = 5x - 16$ at the point $(x, y) = (4, A)$. Determine A. (i.e., find the y-coordinate of the point of intersection)

Possibilities:

(a) 3

(b) $7/2$

(c) 4

(d) $9/2$

(e) 5

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6. A train leaves city A at 8:00 am and arrives in city B at 11:30 am. The train leaves city B at 11:30 am and arrives in city C at 1:30 pm. The average velocity from city A to city B was 42 miles per hour and the average velocity from city B to city C was 64 miles per hour. Determine the average velocity from city A to city C.

Possibilities:

(a) 57.00 miles per hour

(b) 114.00 miles per hour

(c) 50.00 miles per hour

(d) 137.50 miles per hour

(e) 59.33 miles per hour

7. Determine the average rate of change of $g(x)$ from $x = -1$ to $x = 2$, where

$$g(x) = x^2 + 5x + 14$$

Possibilities:

(a) 18.00

(b) 6.00

(c) 8.00

(d) 10.00

(e) 14.00

8. Determine the value of A so that the average rate of change of $f(t)$ from $t = 0$ to $t = A$ is equal to 9, where

$$f(t) = t^3$$

Possibilities:

(a) $A = 3$

(b) $A = 18$

(c) $A = 9$

(d) $A = 27$

(e) $A = 6$

9. A particle moves in a straight line. The position of the particle, in meters, after t seconds is given by

$$s(t) = t^2 + 2t$$

Determine the average velocity of the particle from time $t = 1$ to $t = 1 + h$.

Possibilities:

(a) Average velocity = $4 + h$ meters per second

(b) Average velocity = $2 + h$ meters per second

(c) Average velocity = $2h + 2h + h^2$ meters per second

(d) Average velocity = $(2h + 4 + 2h + h^2)/h$ meters per second

(e) Average velocity = $2h + h^2$ meters per second

10. Find the value of x for which the tangent line to $y = 5x^2 + 3x + 2$ is parallel to the line $y = 9x + 2$

   Possibilities:

   (a) $-1/5$

   (b) 0

   (c) $1/5$

   (d) $2/5$

   (e) $3/5$

11. Suppose $f(x) = ax^2 + bx + c$ for unknown values a, b, and c, and suppose $f'(x) = 10x + 4$. Determine the values of a and b.

   Possibilities:

   (a) $a = 5$ and $b = 4$

   (b) $a = 10$ and $b = 4$

   (c) $a = 4$ and $b = 5$

   (d) $a = 4$ and $b = 10$

   (e) There is not enough information to find a and b.

12. Determine the limit
$$\lim_{x \to 2} \frac{x^2 + 3x + 2}{x^2 - 4x + 3}$$

   Possibilities:

   (a) 12

   (b) -12

   (c) 0

   (d) $1/12$

   (e) The limit is infinite or the limit does not exist.

13. Determine the limit
$$\lim_{x \to 1} \frac{x^2 - 3x + 2}{x^2 + x - 2}$$

Possibilities:

(a) $-1/3$

(b) 0

(c) $1/3$

(d) $2/3$

(e) The limit is infinite or the limit does not exist

14. Determine the one-sided limit
$$\lim_{x \to -4^-} \frac{|2x + 8|}{x + 4}$$

Possibilities:

(a) 4

(b) -4

(c) 2

(d) -2

(e) The limit is infinite or the limit does not exist

15. Which of the following three statements are true?

(I) If the graph of $y = f(x)$ has a vertical asymptote at $x = a$ then $\lim_{x \to a} f(x)$ does not exist.

(II) If the graph of $y = f(x)$ has a corner at $x = a$ then $\lim_{x \to a} f(x)$ does not exist.

(III) If the graph of $y = f(x)$ has a jump at $x = a$ then $\lim_{x \to a} f(x)$ does not exist.

Possibilities:

(a) Only (III) is true

(b) (I) and (III) are true

(c) Only (I) is true

(d) Only (II) is true

(e) (II) and (III) are true

16. Find the value of A which makes $f(x)$ continuous everywhere, where

$$f(x) = \begin{cases} x^2 + A, & \text{if} \quad x \leq 5; \\ 5/x, & \text{if} \quad x > 5 \end{cases}$$

Possibilities:

(a) $A = 1/5$

(b) $A = -24$

(c) $A = -25$

(d) $A = -1/5$

(e) No such value of A exists

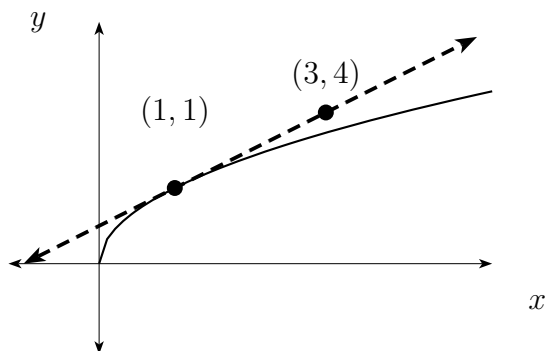17. Determine the equation of the tangent line to $f(x) = 4x^2 - 2x + 13$ at $x = 2$.

Possibilities:

(a) $y = 25(x + 2) - 14$

(b) $y = 14(x + 2) + 25$

(c) $y = 14(x + 2) - 25$

(d) $y = 25(x - 2) - 14$

(e) $y = 14(x - 2) + 25$

18. The graph of $y = g(x)$ is shown (solid), as well as the tangent line to the graph (dotted) at $x = 1$. Determine $g'(1)$.

Possibilities:

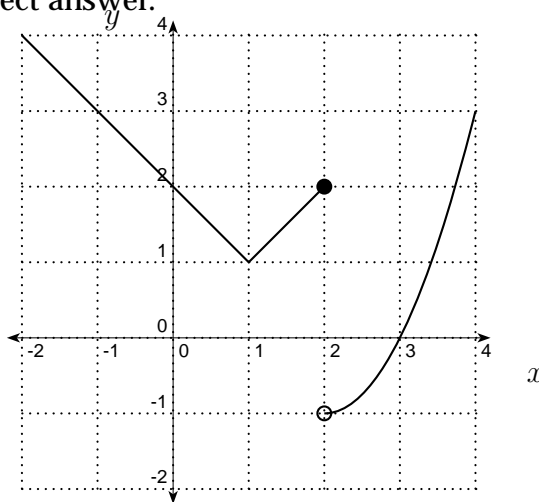(a) $3/2$

(b) 1

(c) $5/2$

(d) 2

(e) $1/2$

19. A particle is traveling along a straight line. The position of the particle at time t is given by $s(t) = -16t^2 + 70t + 125$. Determine the velocity of the particle at time $t = 2$.

Possibilities:

(a) 6

(b) 11

(c) 16

(d) 21

(e) 26

20. The graph of $y = f(x)$ is shown. Select the correct answer.

Possibilities:

(a) $f(x)$ is neither continuous nor differentiable at $x = 1$; $f(x)$ is continuous but not differentiiable at $x = 2$

(b) $f(x)$ is continuous but not differentiable at $x = 1$; $f(x)$ is neither continuous nor differentiiable at $x = 2$

(c) $f(x)$ is continuous and differentiable at $x = 1$; $f(x)$ is differentiable but not continuous at $x = 2$

(d) $f(x)$ is neither continuous nor differentiable at $x = 1$; $f(x)$ is neither continuous nor differentiiable at $x = 2$

(e) $f(x)$ is differentiable but not continuous at $x = 1$; $f(x)$ is neither continuous nor differentiiable at $x = 2$