

Student's Name: _____

Student's ID Number: _____

Instructions:

1. **Do NOT** turn the page until told to do so.
2. Fill in your name and student ID in the space provided above.
3. On the scantron, fill in **your name, section number, student ID. For the test/quiz number, put down 01 for green exam and 02 for orange exam.** Sign your name.
4. There are 12 problems and a total of 7 pages. The maximum possible score for this exam is 100, and each problem is worth the same points.
5. You can use the available space below a question or at the back of each page for your work. Turn in **ONLY** the scantron when you leave. Note: **you will be graded ONLY based on your scantron answer sheet.**
6. Only a one-line display scientific calculator is allowed. NO other electronic devices are allowed. No books or notes are allowed.
7. You will have 60 minutes to complete the exam.
8. **Keep your eyes on your own exam please. Try to cover your scantron answers.**
9. Good luck!

Time	Instructor	Section No.	Time	Instructor	Section No.
7:30am	D. Daniels	0031	7:30am	E. Garcia	0021
7:30am	J. Bates	0110	7:30am	L. Bloome	0107
7:30am	N. Eikmeier	0119	8:30am	N. Eikmeier	0120
8:30am	L. Bloome	0108	8:30am	J. Bates	0109
8:30am	D. Daniels	0051	8:30am	E. Garcia	0061
9:30am	B. Cox	0100	9:30am	S. Rabieniaharatbar	0103
9:30am	I. Aly	0122	10:30am	I. Aly	0121
10:30am	S. Rabieniaharatbar	0104	10:30am	B. Cox	0099
10:30am	D. Nichols	0112	11:30am	D. Stratman	0098
11:30am	Y. Luo	0094	11:30am	D. Nichols	0111
11:30am	C. Mathison	0106	12:30pm	C. Mathison	0105
12:30pm	Y. Luo	0092	12:30pm	D. Stratman	0097
12:30pm	N. Stull	0011	1:30pm	M. Lynn	0041
1:30pm	H. Delgado	0052	1:30pm	M. Perlmutter	0093
1:30pm	N. Stull	0071	1:30pm	A. Yim	0115
2:30pm	M. Lynn	0081	2:30pm	M. Perlmutter	0091
2:30pm	A. Yim	0116	3:30pm	Y. Chen	0117
3:30pm	A. Schneider	0096	3:30pm	P. Stefanov	0101
3:30pm	M. Ochoa	0113	4:30pm	M. Ochoa	0114
4:30pm	T. Terrell	0102	4:30pm	A. Schneider	0095
4:30pm	Y. Chen	0118			

1. Which of the following functions has an amplitude of 2 and a period of 4?

A. $y = 2 \cos(\frac{\pi x}{2})$

B. $y = 2 \sin(4x)$

C. $y = 4 \cos(2x)$

D. $y = 2 \sin(8\pi x)$

E. $y = 4 \cos(\frac{2x}{\pi})$

2. Find the domain of:

$$f(x) = \frac{2 \ln x}{3 - e^x}$$

A. $(-\infty, 0) \cup (0, \infty)$

B. $(0, \ln 3) \cup (\ln 3, \infty)$

C. $(-\infty, \ln 3) \cup (\ln 3, \infty)$

D. $(-\infty, 0) \cup (0, \ln 3) \cup (\ln 3, \infty)$

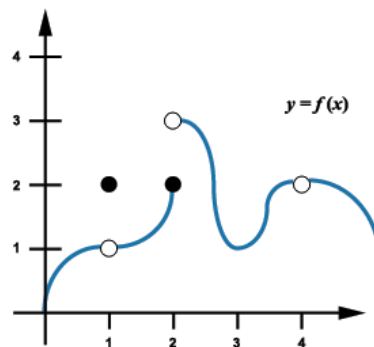
E. $(0, \infty)$

3. Solve for θ ($0 \leq \theta < 2\pi$):

$$\sin^2(2\theta) - \sin(2\theta) = 2$$

- A. $\theta = \frac{\pi}{2}, \theta = \frac{3\pi}{4}, \theta = \frac{7\pi}{4}$
- B. $\theta = \frac{\pi}{2}, \theta = \frac{3\pi}{4}, \theta = \frac{5\pi}{4}$
- C. $\theta = \frac{\pi}{4}, \theta = \frac{\pi}{2}, \theta = \frac{5\pi}{4}$
- D. $\theta = \frac{3\pi}{4}, \theta = \frac{7\pi}{4}$
- E. $\theta = \frac{\pi}{2}, \theta = \frac{3\pi}{2}$

4. Choose the correct statement(s) regarding $f(x)$.



I. $f(x)$ is discontinuous at $x = 1, x = 2$ and $x = 4$.

II. $\lim_{x \rightarrow 2} f(x) = 2$

III. $\lim_{x \rightarrow 4} f(x)$ does not exist.

IV. $\lim_{x \rightarrow 1} f(x) = 2$

- A. I only
- B. IV only
- C. I and II only
- D. I and IV only
- E. II and III only

5. Given $f(x) = \frac{1}{x+1}$, and $g(x) = \frac{x-1}{x^2-1}$, which of the following statements is false?

- A. $g(x)$ has a removable discontinuity at $x = 1$
- B. $f(x)$ has a non-removable discontinuity at $x = -1$
- C. $g(x)$ has a vertical asymptote at $x = 1$
- D. $f(x)$ has a vertical asymptote at $x = -1$
- E. $g(x)$ has a non-removable discontinuity at $x = -1$

6. If $\lim_{x \rightarrow c} f(x) = -6$ and $\lim_{x \rightarrow c} g(x) = 4$, find

$$\lim_{x \rightarrow c} [f^2(x) + 2g(x)]$$

- A. 44
- B. -4
- C. 32
- D. -28
- E. 4

7. Given the piecewise function:

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

Which of the following statements is false?

- A. $\lim_{x \rightarrow -2^-} f(x) = 2$
- B. $\lim_{x \rightarrow -2^+} f(x) = 0$
- C. $\lim_{x \rightarrow 0^-} f(x) = -2$
- D. $\lim_{x \rightarrow 2^-} f(x) = -2$
- E. $\lim_{x \rightarrow 2^+} f(x) = 0$

8. Which of following does NOT equal to positive infinity ($+\infty$)?

- A. $\lim_{x \rightarrow 0^-} \frac{5x + 4}{x^2}$
- B. $\lim_{x \rightarrow 3^+} \frac{3}{x - 3}$
- C. $\lim_{x \rightarrow 2^+} \frac{x + 8}{2 - x}$
- D. $\lim_{x \rightarrow 4^-} \frac{x^2}{\sqrt{16 - x^2}}$
- E. $\lim_{x \rightarrow 2^-} \frac{1}{(x - 2)^2}$

9. Find the limit:

$$\lim_{x \rightarrow 1} \frac{-4x + 4}{x^2 - 4x + 3}$$

- A. 0
- B. 1
- C. 2
- D. $\frac{4}{3}$
- E. DNE

10. Assuming that a , b , and c are positive quantities, which one of the following expressions is not equal to $\ln\left(\frac{ab}{c}\right)$?

- A. $\ln a + 2 \ln \sqrt{b} - 3 \ln \sqrt[3]{c}$
- B. $\ln(a^2b^2) - \ln(abc)$
- C. $\frac{1}{3} \ln a^3 + \frac{1}{2} \ln b^2 - \ln c$
- D. $\ln b^2 + \ln\left(\frac{ac}{b}\right) + \ln c^{-2}$
- E. $\ln(2a) + \ln(2b) - 4 \ln c$

11. Consider the function $f(x) = \frac{1}{2x-1}$. When using the definition of derivative (the limit process) to compute $f'(x)$, we would need to find the following limit:

A. $\lim_{h \rightarrow 0} \frac{-2}{(2x+2h-1)(2x-1)}$

B. $\lim_{h \rightarrow 0} \frac{h-1}{(2x+h-1)(2x-1)}$

C. $\lim_{h \rightarrow 0} \frac{-1}{(2x+h-1)(2x-1)}$

D. $\lim_{h \rightarrow 0} \frac{h}{(2x+2h-1)(2x-1)}$

E. $\lim_{h \rightarrow 0} \frac{-h}{(2x+h-1)(2x+2h-1)}$

12. Given $f(x) = \frac{x^2-9}{x}$, and $f'(x) = \frac{x^2+9}{x^2}$.

Find the equation of the tangent line to the graph of $f(x)$ at $x = -1$.

A. $y = 8x + 18$

B. $y = 8x - 2$

C. $y = 8x - 18$

D. $y = 10x - 2$

E. $y = 10x + 18$