MA 161 & 161E **EXAM 1** **FEBRUARY 9, 2000**

Name:_____

I.D. #:_____

Rec. Instructor:_____ **Time of Rec. Sect.:** _____

Lecturer: _____

Instructions:

1. <u>On the mark sense sheet</u>

    a. Fill in instructor's name and course number.

    b. Fill in your name, student identification number and division and section number, and fill in the appropriate spaces with a pencil.

    c. Fill in the appropriate letter on your mark–sense answer sheet.

    d. Hand in both the answer and question booklet to your recitation instructor when you are done.

2. Verify that you have all the pages (there are 8 pages).

3. Calculators are not allowed.

4. Circle the letter of your response to each question.

1. Solve the inequality $\dfrac{(x-1)(x+3)}{x-2} > 0$ for x.

    A. $-3 < x < 2$

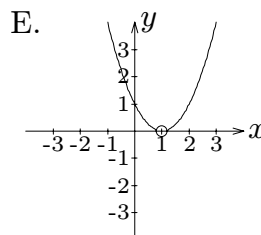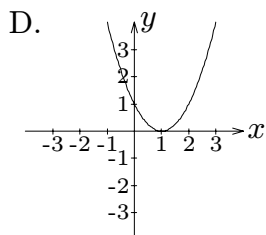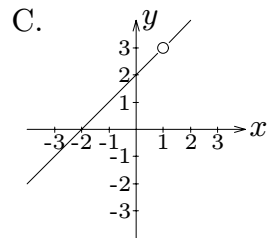   B. $x < -3$ or $1 < x < 2$

    C. $x < -3$ or $x > 1$

    D. $-3 < x < 1$

    E. $-3 < x < 1$ or $x > 2$
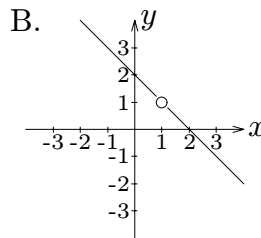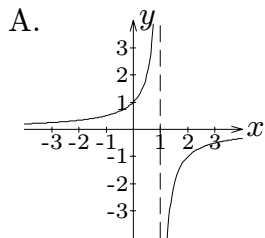
2. Find an equation of the line that is perpendicular to $3x+2y+4 = 0$ and that contains the point $(-2, 1)$.

    A. $3x - 2y + 8 = 0$

    B. $2x - 3y + 7 = 0$

    C. $2x + 3y - 1 = 0$

    D. $-2x + 3y + 9 = 0$

    E. $3x + 2y + 4 = 0$

3. Find the domain of the function $y = \dfrac{3 - \ln(x+2)}{\sqrt{1-x}}$.

A. $x > -2$

B. $x > 1$

C. $x < 1$

D. $-2 < x < 1$

E. all real numbers x

4. Which of the following is the graph of $y = \dfrac{x^2 + x - 2}{x - 1}$?

A.

B.

C.

D.

E.

5. Find the domain for $f \circ g$ where $f(x) = \dfrac{1}{x+2}$ and $g(x) = \dfrac{1}{x-1}$.

    A. $x \neq -2$

    B. $x \neq 1$

    C. $x \neq -2$ and $x \neq 1$

    D. $x \neq \dfrac{1}{2}$ and $x \neq 1$

    E. $x \neq -2$ and $x \neq \dfrac{1}{2}$

6. Solve $\sqrt{3}\sin x < \cos x$ for $0 \leq x < \pi$.

    A. $\dfrac{\pi}{6} \leq x < \dfrac{\pi}{2}$

    B. $\dfrac{\pi}{3} \leq x < \dfrac{\pi}{2}$

    C. $0 \leq x < \dfrac{\pi}{6}$

    D. $0 \leq x < \dfrac{\pi}{3}$ or $\dfrac{\pi}{2} < x < \dfrac{5\pi}{6}$

    E. none of the above

7. $\log_{\frac{1}{9}} 3^x$ is equal to

    A. $-\dfrac{x}{2}$

    B. 3

    C. x

    D. e

    E. $\dfrac{x}{2}$

8. The slope of the line tangent to the graph of $f(x) = 2x^2 - 3x$ at $(2, 2)$ is

    A. 4

    B. 5

    C. $\dfrac{0}{0}$

    D. 3

    E. cannot be determined

9. $\lim\limits_{x \to 2} \left[(x - 2)^2 + 3 \right] \sin \left(\dfrac{\pi}{x^2 - 2} \right)$ is

A. 0

B. 1

C. −1

D. 3

E. 2

10. $\lim\limits_{r \to -2^-} \dfrac{|r + 2|}{r + 2}$ is

A. ∞

B. −∞

C. 0

D. 1

E. −1

11. Let $f(x) = x^2 - 3x + 4$. Find the point on the graph of $y = f(x)$ where the line tangent to the graph is parallel to the line $x + y = 1$.

    A. $(-2, 14)$

    B. $(-1, 8)$

    C. $(0, 4)$

    D. $(1, 2)$

    E. $(2, 2)$

12. Let $f(x) = \dfrac{e^x}{x^3}$. Then $f'(1)$ is

    A. 0

    B. $-e$

    C. $-2e$

    D. $-3e$

    E. $-4e$

13. Let $f(x) = -3x^2 + \dfrac{1}{3x^3}$. Then $f'(x)$ is

A. $-3x + \dfrac{1}{x^4}$

B. $-6x^3 + \dfrac{1}{9x^2}$

C. $-6x - \dfrac{1}{x^4}$

D. $-6x + \dfrac{1}{3x^2}$

E. $-3x - \dfrac{1}{x^2}$

14. The $\lim\limits_{x \to 3} \dfrac{xe^x - 3e^3}{x - 3}$ is the derivative of a function at $x = 3$. Its value is

A. $4e^3$

B. $2e^3$

C. 0

D. $-2e^3$

E. $-4e^3$

15. Let a be a constant and

$$f(x) = \begin{cases} 2x + 1, & x \geq 1 \\ a(x^2 + 2x - 3) + 3, & x < 1. \end{cases}$$

Choose a so that $f(x)$ is differentiable at $x = 1$. Then a is

A. $a = 1$

B. $a = \dfrac{1}{2}$

C. $a = \dfrac{1}{4}$

D. $a = \dfrac{1}{8}$

E. $a = 0$