MA 161/161E EXAM 1 **Spring 2001** **February 1, 2001**

Name

Student ID number

Lecturer

Recitation Instructor

Time of Recitation Class

Instructions:

1. This package contains 14 problems, each worth 7 points, for a total of 100 points (that includes 2 bonus points for coming).
2. Please supply all information requested above and on the mark–sense sheet.
3. Work only in the space provided, or on the backside of the pages. Mark your answers clearly on the mark–sense sheet.
4. No books, notes, or calculator, please.

1. The distance between the points $(1, 1)$ and $(3, 0)$ is

   A. $\sqrt{5}$
   B. 2
   C. $\sqrt{3}$
   D. $\sqrt{2}$
   E. 1

2. The domain of the function $f(x) = \dfrac{x+1}{\sqrt{|2x+3|-1}}$ is

   A. $(-\infty, -2) \cup (-1, \infty)$
   B. $(-1, \infty)$
   C. $(-\infty, 0) \cup (1, \infty)$
   D. $(-\infty, \infty)$
   E. There is no solution

3. Let L be a straight line through $(0, 1)$ and parallel to the line $2x + 3y + 1 = 0$. Then an equation for L is

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

B. $y = -\frac{2}{3}\, x + 1$

C. $y = \frac{3}{2}\, x + 1$

D. $5x - y + 1 = 0$

E. $x + 5y = 0$

4. $\tan(\sin^{-1} x) =$

A. $\cos^{-1} x$

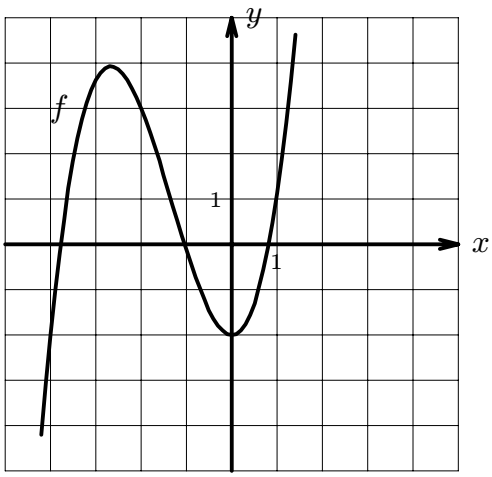
B. $\sqrt{1 + \tan^2 x}$

C. $\sqrt{1 + x^2}$

D. $\dfrac{\sqrt{1 + x^2}}{x}$

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

5. The graph of f is given. Then $f(f(0)) =$



A. -2

B. 0

C. 3

D. -1

E. undefined

6. A rectangle has area 25 (square inches) and one of its sides has length L (inches). Express the perimeter P (in inches) as a function of L.

A. $P = 2L + \dfrac{10}{L}$

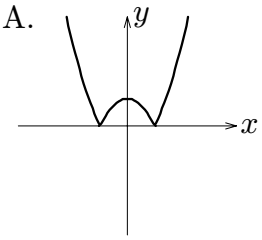
B. $P = 2L + \dfrac{50}{L}$

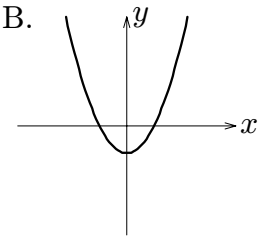
C. $P = L + \dfrac{50}{L}$

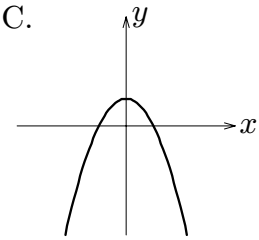
D. $P = L + 50L^2$

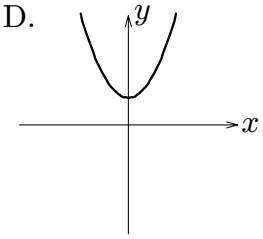
E. $P = 2L - 25L^2$

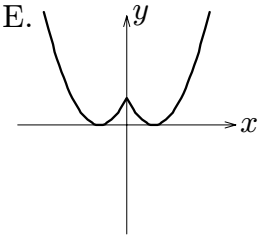
7. The graph of $y = (1 - |x|)^2$ looks like

A. 

B. 

C. 

D. 

E. 

8. In a certain colony of bacteria population triples every 7 hours. Suppose initially there are 1,000 bacteria. After 10 hours the population is

A. $1{,}000 \cdot 3^7$

B. $1{,}000 \cdot 3^{10}$

C. $1{,}000 \cdot 3^{70}$

D. $1{,}000 \cdot 3^{10/7}$

E. $1{,}000 \cdot 3^{1.7}$

9. The solution(s) of the equation $\ln(\ln x) = 0$ is (are)

A. $x = 1$

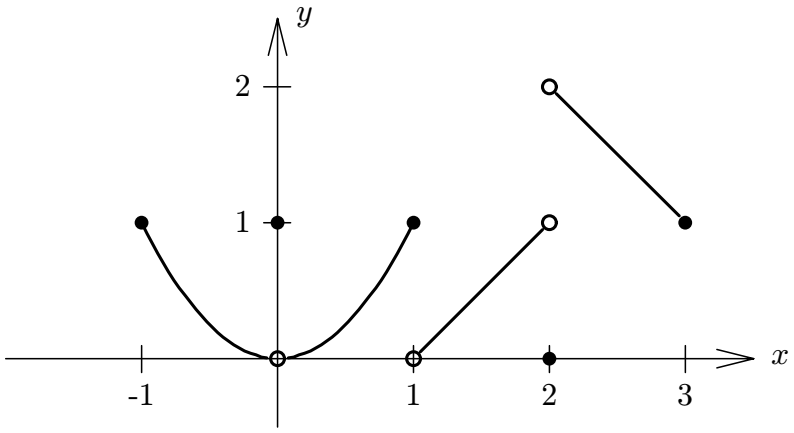
B. $x = e$

C. $x = 1$ and e

D. $x = e^2$

E. The equation has no solution

10. Given the following graph of $f(x)$, which statement is true?



A. $\lim_{x \to 2^+} f(x) = 1$

B. $\lim_{x \to 2^+} f(x) = 0$

C. $\lim_{x \to 2^-} f(x)$ does not exist

D. $\lim_{x \to 2} f(x) = 1$ and 0

E. $\lim_{x \to 2^-} f(x) = 1$

11. If $\lim_{x\to a} f(x) = 4$, $\lim_{x\to a} g(x) = -3$, and $\lim_{x\to a} h(x) = 0$, it follows that $\lim_{x\to a} \dfrac{f(x)g(x)}{h(x)^2}$ is

A. -12

B. 0

C. ∞

D. $-\infty$

E. impossible to determine

12. $\lim_{x\to 1} e^{x^2-x} =$

A. e

B. e^{x^2-x}

C. 1

D. 0

E. ∞

13. If $\lim_{t\to 4} s(t) = -2$, and $\lim_{t\to 4}[3r(t) + 2s(t)] = -1$, then $\lim_{t\to 4} r(t) =$

A. 1

B. -1

C. -2

D. 0

E. cannot be determined.

14. The graph of $y = f(x)$ is reflected about the y–axis, then translated down 4 units and to the right 3 units, and finally compressed horizontally by a factor of 2. The resulting graph has equation

A. $y = f\left(-\left(\frac{1}{2}x - 3\right)\right) - 4$

B. $y = f\left(-\left(\frac{1}{2}x - 3\right)\right) + 4$

C. $y = f(-(2x - 3)) + 4$

D. $y = f(-(2x - 3)) - 4$

E. $y = f(-(2x + 3)) - 4$