

Name: \_\_\_\_\_ I.D.#: \_\_\_\_\_

Section #: \_\_\_\_\_ TA's Name: \_\_\_\_\_

1. This package contains 8 pages and 14 problems, each worth 7 points. Mark your answers on the answer sheet, using a #2 pencil. Turn in both this package and your answer sheet to your recitation instructor.
2. Be sure to fill in your name, ID#, Section #, and the name of your recitation instructor.
3. The exam lasts 60 minutes.
4. No books, notes, or calculators, please.

1. The inequality  $(x - 1)(x + 2)(x - 3) < 0$  is solved by

- A.  $x \leq -2$  or  $1 < x < 3$
- B.  $x < -2$  or  $1 < x < 3$
- C.  $-2 < x < 1$  or  $x > 3$
- D.  $x < -3$  or  $-1 < x < 2$
- E.  $-3 < x < -1$  or  $x > 2$

2. The solutions of the equation  $|x| = |1 + 2x|$  are

- A.  $x = 1$  and  $x = \frac{1}{3}$
- B.  $x = -1$  and  $x = -\frac{1}{3}$
- C.  $x = -1$  and  $x = \frac{2}{3}$
- D.  $x = -2$  and  $x = \frac{1}{3}$
- E. None of the above

3. An equation of the line through  $(1, 2)$  and perpendicular to the line  $3x + 2y = 4$  is

A.  $-3x + 2y - 4 = 0$

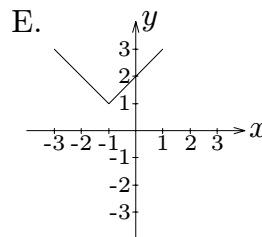
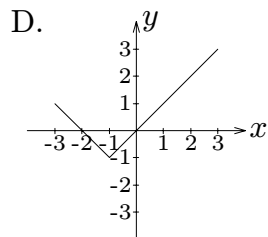
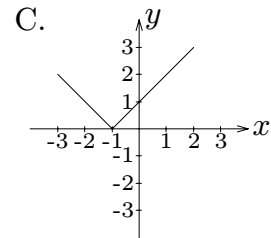
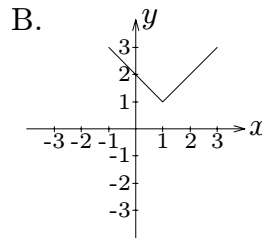
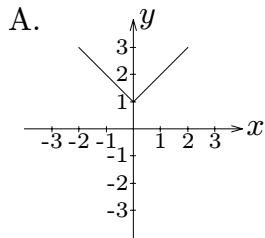
B.  $3x + 6y - 8 = 0$

C.  $-2x + 3y = 4$

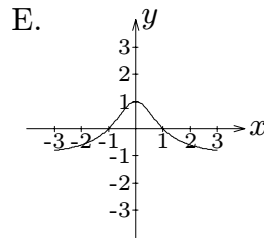
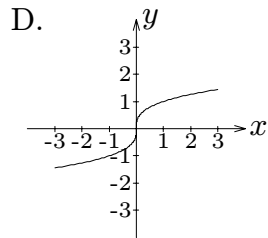
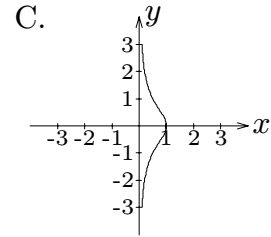
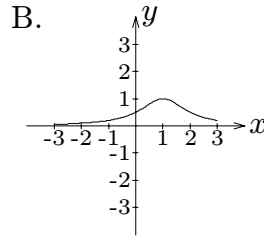
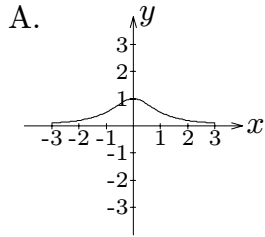
D.  $x - 3y = -5$

E. None of the above

4. The graph of the function  $f(x) = 1 + |x - 1|$  looks most like



5. The graph of the function  $f(x) = \frac{1}{1+x^2}$  looks most like:



6. If  $f(x) = \sqrt{9-x^2}$  and  $g(x) = \sqrt{x-1}$ , the domain of the product  $f(x)g(x)$  is

- A.  $1 \leq x \leq 3$
- B.  $1 < x < 3$
- C.  $-3 \leq x \leq -1$
- D.  $-3 < x < 1$
- E.  $-3 \leq x \leq 1$

7. Solve the inequality  $\sin x > \frac{1}{2}$  for  $x$  in  $[0, \pi]$ .

A.  $\frac{\pi}{4} < x < \frac{3\pi}{4}$

B.  $\frac{\pi}{6} < x < \frac{\pi}{3}$

C.  $\frac{\pi}{2} < x$

D.  $\frac{\pi}{6} < x < \frac{5\pi}{6}$

E.  $\frac{\pi}{3} < x < \frac{2\pi}{3}$

8. Simplify  $\frac{3^{\sqrt{2}}9^{\sqrt{2}}}{3^{3\sqrt{2}-1}}$ .

A. 3

B.  $\frac{1}{3}$

C.  $3^{\sqrt{2}}$

D. 2

E. None of the above

9. If the position of a particle at time  $t$  is given by  $f(t) = 16t^2$ , its velocity at time  $t = 1$  is

- A. 16
- B. -16
- C. 32
- D. -32
- E. 64

10.  $\lim_{x \rightarrow -3} \frac{x^2 - 9}{x^2 + 3x} =$

- A. 0
- B. 1
- C. 2
- D. 3
- E. -3

11. Let  $f(x) = \frac{3x - 3}{x - 1}$  and  $g(x) = \frac{x^3 - 1}{x^2 + 2x + 1}$ . Which of the following statements is true?

- A. Neither  $f$  nor  $g$  is continuous at  $x = 1$
- B. Only  $f$  is continuous at  $x = 1$
- C. Only  $g$  is continuous at  $x = 1$
- D. Both  $f$  and  $g$  are continuous at  $x = 1$
- E. Not enough information

12.  $\lim_{x \rightarrow 0} x^2 \cos \frac{2}{x} =$

- A. 0
- B. 1
- C. 2
- D.  $\frac{1}{4}$
- E. limit does not exist

13.  $\lim_{x \rightarrow 2^-} \left( \frac{1}{x-2} - \frac{2}{x^2-4} \right) =$

- A. 0
- B. 1
- C.  $\infty$
- D.  $-\infty$
- E. -1

14. Let  $f(x) = \frac{2}{x}$  then  $f'(1)$  is

- A. -2
- B. -1
- C. 0
- D. 2
- E. Does not exist