

MATH 114  
02. 21. 2007

Name:

### EXAM I

Please circle the name of your TA:

Nathan Panike

Keya Zhu

Show all your work in order to receive credit. A correct answer without any work will receive 0 credit. Partial credit will be given ONLY for results that are correct and relevant to the problem. Please write your answers neatly. Good luck!

P1	
P2	
P3	
Multiple choice	
TOTAL	

1. (10 points) Let  $A(-1, 1)$  and  $B(7, 9)$  be points in the plane. Write the equation of the line that is perpendicular to the line  $AB$  and passes through the midpoint of the line segment  $AB$ .

2. (10 points) Find the equation of the quadratic function  $f(x)$  that has a minimum equal to  $-18$  at  $x = -1$  and passes through the point  $(1, -10)$ . What are the  $x$ -intercept(s)?

3. i) (8 points) Find the domain of

$$f(x) = \frac{\sqrt{x^2 - 17x + 60}}{x + 4}$$

- ii) (2 points) Determine the quadrant(s) in which the point  $(x, y)$  must be located if  $xy < 0$ .

For each of the following questions circle **only one** answer. If you circle more than one answer you are not getting any credit, even if the right one was among your choices. Each problem is worth 5 points.

4. Simplify the expression

$$\frac{\frac{1}{X} - \frac{1}{X+1}}{\frac{1}{X^2 + 2X + 1}}$$

- A.  $X + 1$    B.  $\frac{X}{X+1}$    C.  $\frac{X+1}{X}$    D.  $\frac{1}{X(X+1)(X^2 + 2X + 1)}$    E. none of these
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5. Solve for  $X$ :       $|3X + 10| = 13$

- A. 1      B. 1, -1      C. 1,  $\frac{23}{3}$       D. 1,  $-\frac{23}{3}$       E. none of these
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6. Write in the form  $a + bi$  the following

$$\frac{-4 + i}{1 + 4i}$$

- A.  $-\frac{8}{17} + i$       B.  $-i$       C.  $i$       D.  $\frac{8}{17} - i$       E. none of these
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7. Given  $f(x) = x + 4$  and  $g(x) = 3x$ , find  $(f \circ g)(2)$ .

- A. 10      B. 36      C. 32      D. 16      E. none of these
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