

MATH 1110 FALL 2003 UNIFORM FINAL

FILE COPY

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 Name: _____

Circle your section number:

001	002	003	004	005	006	OL1
LeMay, N.	LeMay, N.	Russo, T.	Mardones	LeMay, N.	Olson, G.	Byrne, R
MW 10:00-11:45	MW 1:00-2:15	MW 5:30-6:45	TR 8:30-9:45	TR 11:30-12:45	TR 2:30-3:45	N/A

Instructions:

- . Put your name on this page and on the next page.
- . Circle your section number above.
- . You are allowed pencils, erasers and 3"x5" note card full of whatever you want.
- . If you are unclear what a problem is asking, then talk to your instructor for clarification. You may not ask for hints, verification of formulas, or if you have done the problem correctly. This exam is over what YOU know to date.
- . Be neat. If the grader cannot understand what you have recorded, you will not get credit.

DO NOT WRITE BELOW THIS LINE

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1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	Total:	

1. (8 pts) Fill in the blanks

a) The graph of the function $f(x) = \frac{1}{4}x^2 - 16$ is concave _____ (up or down).

b) The vertex of the function $f(x) = -x^2 + x + \frac{1}{2}$ is _____.

c) The discriminant of the function $f(x) = -x^2 - 6x$ is _____.

d) If $f(x) = 3x^2 - 5x + C$ and $f(-1) = 12$, then $C =$ _____.

2. (4 pts) Find an equation of a quadratic function which crosses the x -axis at $x = -3$ and $x = 1$ and is concave up.

3. (4 pts) Simplify $\frac{f(x+h) - f(x)}{h}$, $h \neq 0$ for $f(x) = 4x + 3$.

4. (3 pts) Check the equation $y^2 = x+3$ for symmetry:

a) Is it symmetric with respect to the x -axis? _____

Justification (this is necessary to get credit.)

b) Is it symmetric with respect to the y -axis? _____

Justification

c) Is it symmetric with respect to the origin? _____

Justification.

5. (3 pts) Given the piece-wise function $f(x) = \begin{cases} x+3 & \text{if } x > 1 \\ |x| & \text{if } -1 \leq x \leq 1, \\ -2x-4 & \text{if } x < -1 \end{cases}$

a) $f(2) =$ _____, b) $f(-5) =$ _____ and c) $f(1) =$ _____

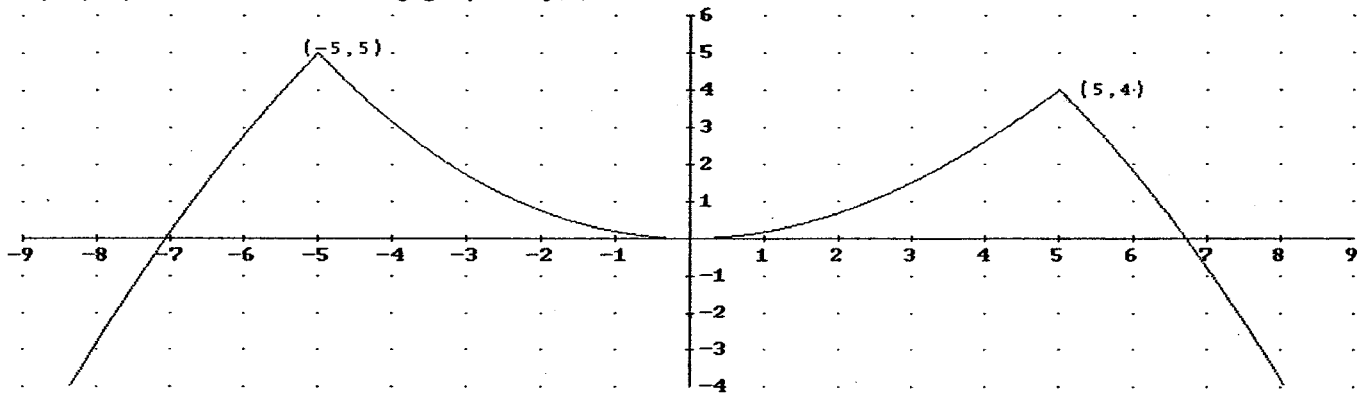
6) (4 pts) Find the equation of the function whose graph is the graph of $y = x^2$, but is shifted down 4 units and to the left 5 units.

7) (5 pts) For $f(x) = 2x+3$ and $g(x) = 4x^2 + 2$

a) $(f+g)(0) =$ _____ b) $(f/g)(2) =$ _____

c) $(g \circ f)(x) =$ _____ (simplify)

8 (8 pts) Given the following graph of $f(x)$,



a) List the intervals on which f is increasing. _____

b) List the intervals on which f is decreasing. _____

c) Find any local minimums and/or local maximums of f

local minimums: _____ local maximums: _____

d) Find the domain and range of the f

domain: _____ range: _____

9 (4 pts) For the polynomial $P(x) = 3(x+2)(x-3)^2$, list each zero followed by its multiplicity.

10. (10 pts) Let $R(x) = \frac{x^2 + x - 20}{x^2 - 14x + 48}$.

a) Domain of $R(x) =$ _____ (use interval notation)

b) The vertical asymptote of $R(x)$ is _____

c) Horizontal/oblique asymptote of $R(x)$ is _____

d) Intercepts of $R(x)$ are _____

11. (9 pts) Perform the following in the complex domain. Write all answers in the form $a + ib$

a) $(5+9i)(5+4i) =$

b) $\frac{8+5i}{2-7i} =$

c) Solve $x^2 + x + 2 = 0$.

12) (9 pts) Let $f(x) = 2x^3 - 3x^2 + 4x - 6$.

a) Find the quotient and remainder when $f(x)$ is divided by $x - 3$:

b) Use synthetic division to determine whether $x - 2$ is a factor of $f(x)$.

c) List the potential rational zeroes of $f(x)$.

13 (6 pts)

a) Write as sums and/or differences of logarithms of linear terms:

$$\ln\left(\frac{2x+3}{x^2-3x+2}\right)^2 =$$

b) Simplify as a single logarithm (Do not simplify):

$$\frac{1}{2}\log(x^2+1) - 4\log\left(\frac{1}{2}\right) - \frac{1}{2}(\log(x-4) + \log(x)) =$$

14 (12 pts) Solve for x

a) $2^{x+1}8^{-x} = 4$

b) $3^{x^2-0.5x} = \sqrt{3}$

c) $\log_6(x+3) + \log_6(x+4) = 1$

15 (5 pts) As a promotion, a local movie theatre change \$3.00 for adults and \$1.50 for seniors at the 1:00 showing. At one showing, 450 people attended and \$1200 was taken in. How many seniors attended the showing?

16 (6 pts) Let $A = \begin{bmatrix} 0 & 4 \\ 1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 2 \\ -2 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 4 & 2 \\ -6 & 2 \end{bmatrix}$

a) $2A - 3B =$

b) $BC =$