Math 100 Exam II

7:30pm–8:30pm, Tuesday October 9, 2001

Recitation Instructor:_____

Recitation Day/Time:_____ **Name:**_____

No books or notes are allowed. Please read the problems carefully and do **all** you are asked to do. **You must show your work!** Use back pages as scratch paper. Do problems at spaces provided.

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1. (10pts) Write the complex numbers in standard form:

(a) $(3+2i)^2 =$

(b) $\dfrac{2+3i}{3+2i} =$

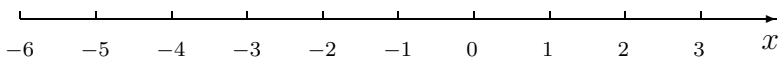
2. (10pts) Find all (real and complex) solutions of the following equations.

(a) $x^3 - 3x^2 + 3x - 9 = 0$

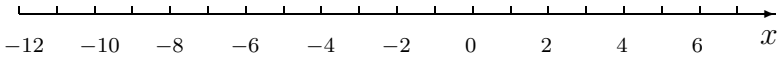
(b) $\dfrac{2}{x} = \dfrac{3}{x-2} + 1$

3. (10pts) Solve the Inequalities and graph your solutions:

(a) $1 - 3x \geq x - 4$



(b) $|x+3| > 7$



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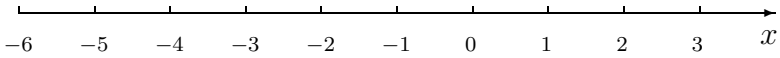
4. (10pts) Solve the inequality $x^3 - x^2 - 6x > 0$ and graph your solutions.



5. (10pts) Write down the equation of the straight line passing through two points $(1, 2)$ and $(3, 2)$. Then compute the y-intercept and slope of the line.

Slope=

y-intercept=

6. (10pts) Your salary was \$28,500 in year 1997 and \$32,900 in 1999. What will be your salary in year 2005 if your salary follows a linear growth.

7. (10pts) Let $g(x) = -x^2 + 4x + 1$. Evaluate and simplify

(a) $g(-2) =$

(b) $g(h + 2) =$

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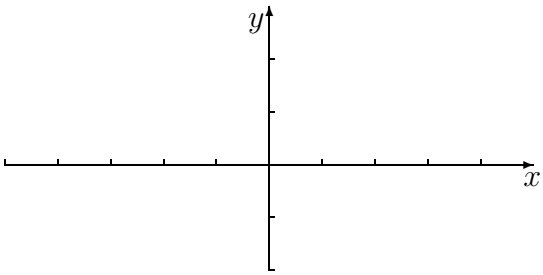
8. (10pts) Let $f(x) = x^3 - 3x^2 - x + 1$. Use your calculator to

(a). (2pts) Graph the function. (copy the graph from your calculator carefully and write down your window settings.)



(b). Find the relative minimum and relative maximum (both x and y-coordinates) (approximate to 3rd decimal place).

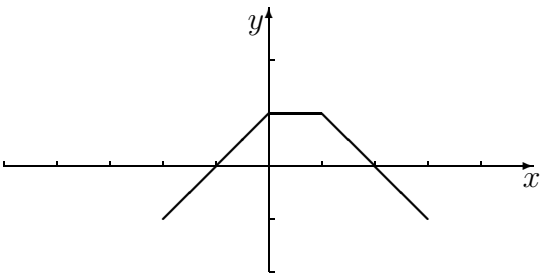
(c). List the intervals of increasing and the intervals of decreasing.
Intervals of increasing: Intervals of decreasing:

9. (10pts) Given functions $f(x) = x^2 + 1$ and $g(x) = \sqrt{x}$,
(a).(2pts) Find the domains of functions $f(x)$ and $g(x)$;
$f(x)$ $g(x)$

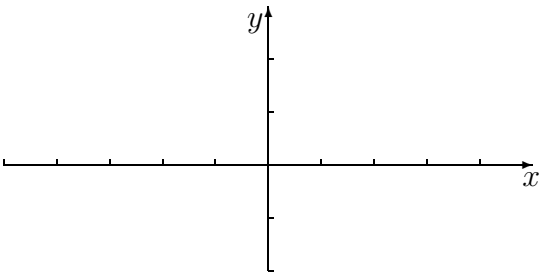
(b). Find $f \circ g$ and its domain;
$(f \circ g)(x) =$ Domain:

(c). Find $g \circ f$ and its domain;
$(g \circ f)(x) =$ Domain:

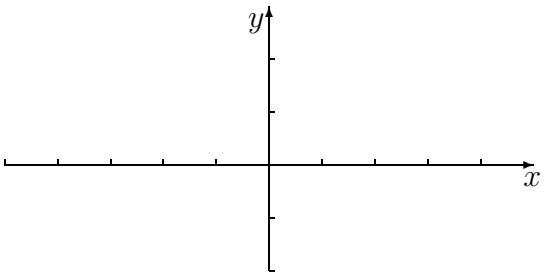
10 (10pts) The graph of a function $f(x)$ is on the right. Graph the given functions.



(a). $y = f(-x)$



(b). $y = 2f(x)$



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