REVIEW TEST 2
Chapter 8 (8.1, 8.2, 8.3, 8.4, 8.5)

To prepare for the test, study the following:

- **Handout Section 8.2**
- **Handout Section 8.3**

and the following exercises:

I QUADRATIC EQUATIONS.

Solve (in $\mathbb{C}$) by extracting roots:

1) $9x^2 = 25$; 2) $\frac{2x^2}{3} = 4$; 3) $\left(x - \frac{1}{2}\right)^2 = \frac{3}{4}$;

4) $3(x-2)^2 + 38 = 0$ 5) $4(x+2)^2 = 12$ 6) $1 - 3(x-1)^2 = 10$

Solve the following (in $\mathbb{C}$) by completing the square:

7) $x^2 - 6x - 7 = 0$; 8) $2x^2 - 6x - 5 = 0$; 9) $-4x^2 - 36x - 65 = 0$;

Solve the following (in $\mathbb{C}$) by the quadratic formula:

10) $2x^2 + 1 = 4x$; 11) $x^2 - \frac{x}{2} + 1 = 0$; 12) $\frac{1}{2}x^2 + 1 = \frac{3}{2}x$;

II QUADRATIC EQUATIONS

1) Write a quadratic equation with rational coefficients that has: a) $1 - \sqrt{2}$ as a solution; b) -2 and 3 as solutions;

Write (in standard form) a quadratic equation with real coefficients that has 1-2i as a solution.

2) Solve each equation for the indicated variable:

a) $3x^2 + xy + y^2 = 2$, for y; b) $A = 2w^2 + 4lw$, for w; c) $a^2 + b^2 = c^2$, for b.

3) Show in two different ways that 3-2i is a solution of $x^2 - 6x + 13 = 0$.

4) Solve the following equations: a) $x^4 - 3x^2 = -2$; b) $x^{\frac{2}{3}} - 2x^{\frac{1}{3}} - 3 = 0$; c) $x + \sqrt{x} - 6 = 0$;

III QUADRATIC FUNCTIONS (PARABOLAS)

1) Answer all questions; show all work. Let $y=\frac{1}{3}(x+3)^2-2$ be a parabola.

a) What type of curve is this?; b) y-intercept?; c) Vertex ; d) x- intercept(s)? ; e) sketch its graph; f) What is the standard form of the equation? g) Domain? h) Range? i) Is this function one-to-one? Does it have an inverse?

2) Answer all questions for each parabola.

i) $y=-2x^2+x+3$ ii) $y=-10x^2-2x+1$ iii) $y=\frac{1}{7}x^2-8x+66$

a) What type of curve is this?; b) y-intercept?; c) Vertex ; d) x- intercept(s)? ; e) sketch its graph; f)What is the vertex form of the above equation? g) Domain? h) Range? i) Is this function one-to-one? Does it have an inverse?

3) Let $f(x)=2\left(x+\frac{1}{3}\right)^2-\frac{4}{9}$. Find the following and simplify(don't give approximate answers):

a) The domain of f(x); b) f(2); c) Find values of "x" where f(x)=2 d) The range of f(x).

IV INEQUALITIES

Solve the following inequalities. **Write the solution set in interval notation:**

1) $x^2-6x-7\le 0$; 2) $6x-x^2\ge 7$; 3) $x(2-3x)(x-3)\ge 0$;

4) $\frac{3}{x+3}>\frac{3}{x-2}$;