College Algebra-Math 100
Exam 2–Summer 2005
July 6,2005

Name:

Instructor:

Please show all work and simplify all answers completely

1. (5 pts) Find the zero of the function: $g(x) = 3x - 15$

2. (5 pts) Solve $4(x-1) - 3x = 2(x+1) + 6$

3. (6 pts) Simplify and write answer in the form of $a + bi$: $\frac{5+3i}{6+8i}$

4. (10 pts) Find all solutions:

   (a) $x^2 + 4x + 5 = 0$

   (b) $x^2 - 5x + 6 = 0$

5. (5 pts) Simplify: $i^{14} + 1$

6. (10 pts) Given $f(x) = x^2 - 3x + 2$,

   (a) Find the vertex of the graph of $f(x)$:

   (b) Find the symmetry of the graph of $f(x)$;

   (c) Determine whether there is a maximum or minimum value for the function $f(x)$ and find that value.

7. (15 pts) Solve:

   (a) $\frac{1}{x^2-4} + \frac{3}{x+2} = \frac{2x+1}{x^2-4}$

   (b) $\sqrt{5x+4} = \sqrt{19}$

   (c) $|\ x + 2\ | -5 = 3$

8. (10 pts) Solve the following inequalities:

   (a) $-2 \leq 1 - 3x < 2$

   (b) $\mid x - 5 \mid \leq 4$

9. (5 pts) Given $f(x) = x^4 - 15x^2 + 10$,use the Intermediate Value Theorem to determine if the function $f(x)$ has real zeros between 1 and 5.

10. (5 pts) Use synthetic division to determine whether the number 2 is a zero of the polynomial function $f(x) = 5x^2 - 15x + 10$

11. (5 pts) Find the quotient $Q(x)$ and the reminder $R(x)$ for $\frac{x^3-3x^2+5x+1}{x+2}$

12. (5 pts) Find a polynomial of the lowest degree with rational coefficients that has zeros $2-i$ and $\sqrt{2}$

13. (10 pts) For $f(x) = x^3 + 2x^2 + 5x + 10$

    (a) find the rational zeros and then find the other zeros

    (b) factor the polynomial $f(x)$ into linear factors (using results in part a)

14. (4 pts) Use the leading term test to match each polynomial with its graph's behaviour:

    (a) $f(x) = 3x^4 - 5x^3 + 2x + 2$
    (b) $g(x) = x^5 - 3x^3 + 4x + 1$
    (c) $h(x) = -5x^4 - 5$
    (d) $p(x) = -7x^3 + 11x^2 + 2x + 10$