Algebra 2 Worksheet Name: _____
Section 6.6 – Fundamental Theorem of Algebra DAY ONE

I. Use the Irrational Root Theorem and the Fundamental Theorem of Algebra to find the smallest possible degree of the polynomial with the given roots.

1. $1+2i,\ i,\ -5$	2. $-\sqrt{3},\ \frac{3}{5}$	3. $\sqrt{6},\ -5i,\ 1+\sqrt{3},\ 2-9i$

II. Write the simplest polynomial function (in standard form) with the following zeros.

4. $-2,\ 2,\ 3$	5. $-2,\ \frac{1}{2},\ 2$	6. $-1,\ -1,\ 2$

III. Solve each equation by finding all the roots. HINT: All of these can be factored to start.

7. $x^4-81=0$	8. $x^3-3x^2+4x-12$

9. $x^4 + 3 = 4x^2$	10. $2x^3 + 8x = 3x^2 + 12$

IV. Graphing Calculator.

11. Consider the polynomial function $f(x) = 2x^4 + 3x^3 + 14x^2 + 24x - 16$.

(a) Use the Rational Root Theorem to list the possible rational roots of this equation.

(b) Graph the polynomial on a graphing calculator. Which possible rational roots are zeros of $f(x)$? How do you know?

(c) According to the graph, how many other real zeros does the function have?

(d) How many imaginary zeros does the function have?

(e) Find the imaginary zeros. SHOW YOUR WORK.

V. Find all the roots of the function given a root. HINT: Use your calculator. Explain your answer.

12. $f(x) = x^4 - 2x^3 - 4x^2 + 18x - 45$; given $1 + 2i$ is a root