Name _____ Date _____

Practice 2.2/2.3: Complex Factors and Roots

1. Find all the factors and all the roots of each polynomial

a. $f(x) = x^2 + 2x + 5$

b. $f(x) = x^2 - 6x + 13$

c. $f(x) = 2x^3 + 32x$

d. $f(x) = x^4 - 256$

e. $f(x) = x^4 - 5x^2 - 36$

f. $f(x) = x^4 + 20x^2 + 64$

g. $f(x) = x^3 - 3x^2 + 9x - 27$

h. $f(x) = x^3 + 4x^2 + 25x + 100$

i. $f(x) = x^3 - 5x^2 + 16x - 80$
(hint: $4i$ is a root)

j. $f(x) = x^3 - 4x^2 + x + 26$
(hint: $3 - 2i$ is a root)

2. Find a polynomial with the following zeros

a. 2, 2, -5

b. -1, $6i$

c. 3, -3, $3i$, $-3i$

d. 0, 0, 0, $-4i$, $5i$

e. $4 - 3i$

f. $5 - 2i$, 3

Extra Credit:

3. Find all the factors and zeros
$f(x) = \mathbf{x^4 + 6x^3 + 29x^2 + 24x + 100}$ (hint: $2i$ and $3 - 4i$ are roots)

4. Find a polynomial with the following zeros. -1, $3 + 4i$, $-2i$