Name: _____ Date: _____ **Unit 6 Class Work**

Sums and Differences of Cubes Class Work

Objective: *You will be able to rewrite polynomial expressions in factored form, and use the factored form to solve equations.*

Multiply each pair of polynomials.

a. $(z + 4)(z^2 - 4z + 16)$

b. $(p - 2)(p^2 + 2p + 4)$

c. $(n - 5)(n^2 + 5n + 25)$

d. $(2x - 3)(4x^2 + 6x + 9)$

Do you notice any patterns or relationships?!?

Sums and Differences of Cubes:

We can use these general formulas to factor binomials that are sums/differences of cubes:

*(sum/difference)(1st value squared, opposite sign, 1st*2nd values, positive 2nd value squared)*

Guided Examples: *Factoring*

A. Factor $24x^3 - 81$.

B. Factor $r^6 + 343$

***Check your work by multiplying!**

Practice: Factor each binomial completely.

1. $w^3 + 125$

2. $54x^3 - 2$

3. $p^6 - 8r^3$

4. $b^{24} + 512$

5. $500s^3 + 32$

6. $3h^{12} - 192$

7. $8m^3 + 27n^6$

8. $x^9 - y^9$

9. $3x^4 + 3x - 2x^3 - 2$

10. $2x^4 + 5x^3 - 16x - 40$

Guided Examples: *Solving*

C. Solve the equation $x^3 - 64 = 0$. State the multiplicity of each root.
*Note, solutions are also known as "roots."

D. Solve the equation $250x^3 + 2 = 0$. State the multiplicity of each root.

✎ **Practice:** Solve each equation, and state the multiplicity of each root.

1. $2x^3 - 2000 = 0$

2. $32x^3 + 4 = 0$

3. $3x^3 = -192$

4. $56x^4 - 40x^3 = 5 - 7x$

5. $27x^4 + 54x^3 - x = 2$

6. $4x^4 - 2x^3 - 250x = -125$

***Please write down any important reminder related to sums/differences of cubes OR a question you have related to sums/differences of cubes.**