Name: Sums and Differences of Cubes Class Work

And use the factored form to solve equations.

Multiply each pair of polynomials.

a. $(z + 4)(z^2 - 4z + 16)$ b. $(p - 2)(p^2 + 2p + 4)$ $\begin{bmatrix} 2^3 + 1 & 2 & 3 \\ 2^3 + 2 & 4 & 4 \end{bmatrix}$ And I middle terms $\begin{bmatrix} 2^3 + 2 & 4 & 4 & 4 \\ 2 & 4 & 4 & 4 \end{bmatrix}$ And I middle terms $\begin{bmatrix} 2^3 + 2 & 4 & 4 & 4 \\ 2 & 4 & 4 & 4 \end{bmatrix}$ And I middle terms $\begin{bmatrix} 2^3 + 2 & 4 & 4 & 4 \\ 2 & 4 & 4 & 4 \end{bmatrix}$ $\begin{bmatrix} 2^3 + 2 & 4 & 4 \\ 2 & 4 & 4 \end{bmatrix}$ $\begin{bmatrix} 2$

Do you notice any patterns or relationships?!?

★ Discover!

What product would result in...

$$(4v-3)(16v^2+12v+9)$$

★ Sums and Differences of Cubes:

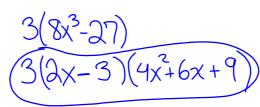
We can use these general formulas to factor binomials that are sums/differences of cubes:

Name: Date: Unit 6 Class Work

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

Guided Examples: Factoring

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



B. Factor $r^6 + 343 = (r^2 + 7)(r^4 - 7r^2 + 49)$

*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.
$$500s^3 + 32$$

- 7. $8m^3 + 27n^6$ 8. $x^9 y^9$

- 9. $3x^4 + 3x 2x^3 2$
- 10. $2x^4 + 5x^3 16x 40$

Practice:

Factor each binomial completely.

- 1. $w^3 + 125$
- 2. 54x³ 2
- 3. $p^6 8r^3$
- 4. $b^{24} + 512$
- 5. $500s^3 + 32$
- 6. 3h¹² 192

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

8. x⁹ - y⁹

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.
$$3x^3 = -192$$

3.
$$3x^3 = -192$$
 4. $56x^4 - 40x^3 = 5 - 7x$

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

6.
$$250x^4 + 125x^3 - 2x = 1$$

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

1.
$$2x^3 - 2000 = 0$$
 2. $32x^3 + 4 = 0$

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

$$3. 3x^3 = -197$$

3.
$$3x^3 = -192$$
 4. $56x^4 - 40x^3 = 5 - 7x$

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

6.
$$250x^4 + 125x^3 - 2x = 1$$

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