Difference of Squares	$a^2 - b^2$	
Sum of Cubes	$a^3 + b^3$	
Difference of Cubes	$a^3 - b^3$	

Factor each:

1. $27 - r^3$	2. $8m^3 - 27n^3$
3. $x^3 + 81$	4. $16x^4 + 54xy^3$

Factor by grouping:

$4x^3 + 2x^2 - 2x - 1$	$10ab - 6b + 35a - 21$

$8r^3 - 64r^2 + r - 8$	$4x^6 + 36 - x^6y - 9y$

Factor each expression completely:

1. $3y^5 - 75y^3$	2. $x^3 - 3x^2 - 16x + 48$
3. $2x^4 + 128x$	4. $2p^8 + 10p^5 + 12p^2$

Use the zero product property to solve:

5. $3x^5 + 15x = 18x^3$	6. $5b^3 + 15b^2 + 12b = -36$
7. $x^6 - 4x^4 - 9x^2 + 36 = 0$	8. $x^3 + 1000 = 0$

Factor the following:

9. $8ax + 4bx + 4cx + 6ay + 3by + 3cy$	10. $20fy - 16fz + 15gy + 8hz - 10hy - 12gz$
11. $x^6 - y^6$	12. $a^3x^2 - 6a^3x + 9a^3 - b^3x^2 + 6b^3x - 9b^3$

13. $150n^8 + 40n^4 - 15$	**14.** $y^8 + 12y^3 + 8$