Name: _____ Date: _____ Math 9/10 Honors

Lesson 1.2 – Binomial Expansion & Factoring Polynomials (pages 53-64 in Red 9/10 textbook)

I.   Warm-Up: Expand the following expressions

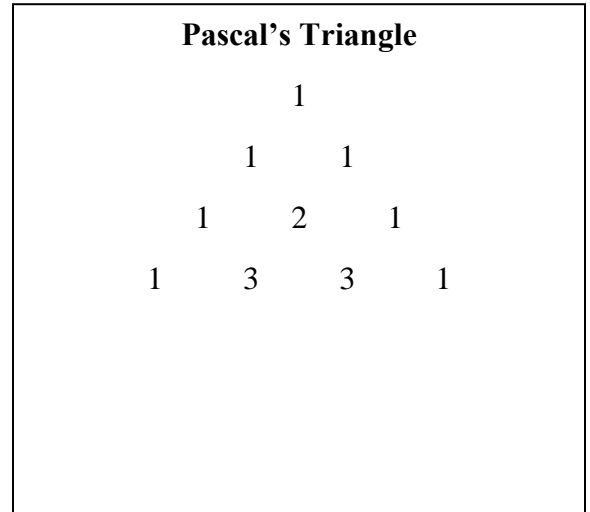a. $(x + y)^2$ b. $(x + y)^3$

II.   Binomial Expansion   *What's next?*

1. Expand $(x + y)^4$

Pascal's Triangle
1
1   1
1   2   1
1   3   3   1

2. Expand $(x + y)^5$

3. Expand $(x - y)^5$

III.   Practice on Your Own

4. Expand $(x - 2y)^4$

5. Expand $(x + 2)^5$

6. Expand $\left(\frac{x}{2} + \sqrt{y}\right)^3$

IV. Highest Common Factors & Reordering Expressions

Factoring is the reverse of expanding, where you rewrite a polynomial expression as a product of its factors.

Factor all of the following expressions.

7. $6x^2 + 4x$

8. $-2x^2 - 4x$

9. $-4(a + 1) + (a + 2)(a + 1)$

10. $3ab + d + 3ad + b$

11. $x^2 + 2x + 5x + 10$

12. $x^2 + 3x - 4x - 12$

V. Factoring Special Patterns

13. $4 - 9y^2$

14. $9a - 16a^3$

15. $4x^2 + 4x + 1$

16. $8x^2 - 24x + 18$

Recall:

FOIL Method

$(a + b)(c + d)$

Differences of Squares Pattern

Perfect Square Pattern

VI.   **Factoring Quadratic Trinomials (a = 1)**

17. $x^2 - 7x + 12$

18. $x^2 - 2x - 15$

19. $3x^2 + 6x - 72$

20. $77 + 4x - x^2$

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Factoring Quadratic Trinomials

Consider the expansion of the product

$(x + 2)(x + 5) =$

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VII.   **Factoring Quadratic Trinomials (a = 1)**

21. $3x^2 + 17x + 10$

22. $6x^2 - 11x - 10$

23. $-5x^2 - 7x + 6$

VIII.   **Practice on Your Own**

24. $x^2 - 2x - 15$

25. $x^2 - 81$

26. $4x^2 - 16$

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Splitting the Middle Term

Consider the expansion of the product

$(4x + 3)(x + 2) =$

Now do it backwards:

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27. $16x^2 - 24x + 9$

28. $x^3 + 27$

29. $x^3 - 8$

30. $t^5 + 4t^4 - 5t^3$

31. $x^3 + 10x^2 - 36x - 360$

32. $4a^2 + 36ab + 81b^2 - 49$

33. $25x^{16} - 9y^6$

34. $(x - 1)(x + 6)^2 - (x - 1)^2(x + 6)$

35. $343x^{12} - 8y^{15}$

More Special Patterns:

Sum of Cubes

Difference of Cubes