Adv Alg 4

Name _____
Date_____Pd__

POLYNOMIAL REVIEW SHEET

I. Determining Degree: To determine the degree of a polynomial, simplify first (if necessary), then identify the highest exponent. The highest exponent is the degree of the polynomial**.**

State the degree of each polynomial.

1. $3x^2 + 2x – 5x^3 + x^4 + 7x^3$

2. $6a^2a^5 – 4a^2 – 10$

3. 8

4. $8z^5 – 7z + z^5z – 4z$

II. Adding/Subtracting Polynomials: Add/subtract like terms only (adding/subtracting does not change the exponent).

5. $(5x^2y + 6xy – 3xy^2) + (2xy – 10x^2y + 2xy^2)$

6. $(7m^3 + 5m^2 – 8m + 3) – (10m^3 + 3m^2 – 8m – 3)$

7. Add $3x^2 + 5x + 2$ to $8x^2 – 6$.

8. What is the result when $p^2 – 4p + 1$ is subtracted from $3p^2 + p – 5$?

III. Properties of Powers

Remember:

- Adding/subtracting – add/subtract coefficients; keep exponents the same
- Multiplying – multiply coefficients; add exponents
- Dividing – divide coefficients; subtract exponents
- Power to a power (exponent outside a monomial) – raise coefficients to exponent; multiply exponents
- Negative exponents – reciprocate/flip the exponent and base

Simplify.

9. $\dfrac{(3x^4)^2}{x^3}$

10. $(5x^2y)(–3x^3y^{–4})$

11. $\left(\dfrac{3}{4}x^3\right)^2$

12. $\dfrac{16x^3yz^5}{4xy^2z}$

IV. Multiplying Polynomial: Use the BOX or the distributive property (also called FOIL only with multiplying binomials)

13. $x^2(3x + 5)$

14. $3xy^2(4xy^3 + xy + 2)$

15. $(x + 6)(2x – 3)$

16. $(3m + 1)(4m + 5)$

17. $(2x – 7)^2$

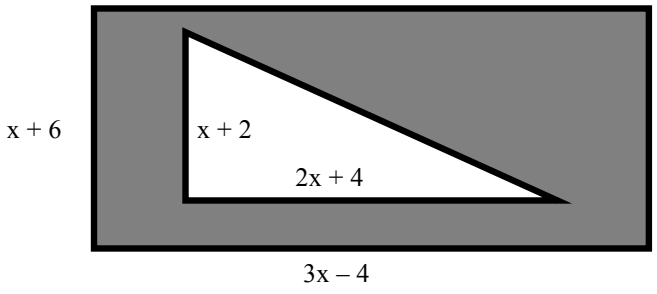
18. $(4a + 9)(4a – 9)$

V. Applications

19. What is the area of a square whose perimeter is $16x + 28$?

20. Bradley is extending his rectangular living room. The original dimensions are 6 feet by 11 feet. If he extended his room by 8 feet in each dimension, what is the new area? How many square feet of area did he add?

21. What is the area of the shaded region below? **(**Area of rectangle = lw ; Area of triangle = ½ bh**)**



22. What is the volume of a rectangular prism with a length of 8, a width of $3x + 7$, and a height of $2x – 5$? **(V = Lwh)**

VI. Factoring polynomials – GCF (Greatest Common Factor).

To find the GCF….

- Break down every term into prime factors.
- Look for factors that appear in every single term to determine the GCF
- Factor the GCF out from every term in front of parentheses and group the remnants inside the parentheses.

A. Factor out the GCF from each polynomial.

23. $18x - 9$

24. $10x^2 – 20x^4$

25. $3 – 9y + 12y^3$

26. $2a^{10} + 22a^8 – 28a$

27. $5x^2y + 10xy^2$

28. $21m^4n^5 + 28m^2n^3$

B. Factor each trinomial into two binomials for a = 1.

Remember…

- The standard form of a polynomial is $ax^2 + bx + c$
- First, set up parenthesis i.e. ( )( )
- Second, place the factors for the variable in the first position i.e. (x)(x)
- Third, find the factors of "c" that add up to be "b" and place them in the second position

29. $x^2 + 4x + 4$

30. $x^2 + 5x + 4$

31. $x^2 - 4x + 4$

32. $x^2 + 7x + 12$

33. $x^2 - 4x - 12$

34. $x^2 - 8x + 16$

C. Factor each trinomial into two binomials for a > 1.

Remember...

- When a ≠1, first check to see if a GCF can be factored out.
- Use the diamond and box method to factor OR the AC method.
- For the diamond, multiply "a" and "c" and put the product in the top of the diamond, and "b" goes in the bottom**.**
- Find the factors of the number at the top of the diamond that add up to be the number at the bottom of the diamond. Those factors go into the sides of the diamond.
- Create a box, the top left square has the "ax^2" term and the bottom right box has the "c" term.
- Multiply the terms from the sides of the diamond by the variable (i.e. "x"), and place them in the empty squares of the box.
- Find the factors of the terms in the squares, and place those factors on the outside of the box.
- Set up parenthesis, i.e. ( )( ).
- The factors of the "ax^2" term go in the first position, and the factors of the "c" term go in the second position.

35. $3x^2 - 2x - 5$

36. $2x^2 + 3x - 9$

37. $5x^2 + 19x + 12$

38. $4x^2 + 10x + 4$

39. $7x^2 + 53x + 28$

40. $9x^2 + 66x + 21$