

Algebra 2 – Chapter 6 Review

Name: _____ Hour: _____

Simplify the following Expressions (6.1)

1. $b^6 * b^3 =$

2. $\frac{y^{12}}{y^{-5}} =$

3. $\frac{2^8 m^{18} n^{-14}}{2^{-5} n^4 m^{11}} =$

4. $\frac{5x^4}{10y^{-2}} * \frac{y^7 x}{x^{-1} y} =$

State the Degree, Leading Coefficient, and Constant of the following polynomials. If the equation is not a polynomial, state why. (6.2). Then state the end behavior of the following polynomials. (6.5)

5. $f(x) = -22x^3 + 12x^2 - 4 + x$

Degree: _____ Leading Coefficient: _____ Constant: _____ End Behavior: _____

6. $g(x) = \frac{1}{2}x^2 - 5x^3 + \frac{4}{7}x^4 - 11$

Degree: _____ Leading Coefficient: _____ Constant: _____ End Behavior: _____

7. $k(x) = 12.3x^2 - \pi - 3x$

Degree: _____ Leading Coefficient: _____ Constant: _____ End Behavior: _____

8. $y = -7x^3 + 2x^{-2} + 4$

Degree: _____ Leading Coefficient: _____ Constant: _____ End Behavior: _____

Add, Subtract, or Multiply the following polynomials as indicated. (6.2)

9. $(2x^4 - 3x^3 - 2x + 4) + (-8x^3 + 4x^2 + 3x - 6) =$

10. $(7x^3 + 20x - 3) - (x^3 - 2x^2 + 14x - 18) =$

11. $(x^2 - 1)(2x^2 + x - 1) =$

12. $(2x + 1)(x^3 - 3x^2 + 5) =$

Factor the following Polynomials. (6.3)

Sum of Cubes: $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

Difference of Cubes: $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

Difference of Squares: $a^2 - b^2 = (a + b)(a - b)$

13. $(x^3 - 8) =$

17. $4x^2 - 25 =$

14. $x^3 - 2x^2 + 4x - 8 =$

18. $12x^3 - 9x^2 + 4x - 3 =$

15. $x^4 + 3x^2 + 2 =$

19. $x^3 - 36x =$

16. $2x^3 + 54 =$

Solve each factored polynomial by setting each factor equal to 0 and solving. (6.3)

Algebra 2: Only state real zeros. Confirm that any remaining zeros are Not real.

20. $(x^2 - 4)(2x^2 + 8) = 0$

21. $(x - 3)(x^2 + 3x + 9) = 0$

22. $x^2(2x - 6) = 0$

Use Synthetic Division to divide the following polynomials. (6.4)

23. $(x^3 - 7x - 6) \div (x + 2)$

24. $(2x^3 + 3x^2 - 39x - 20) \div (x - 4)$

25. $(x^3 - 14x^2 + 47x - 18) \div (x - 9)$

26. $(5x^3 - 27x^2 - 17x - 6) \div (x - 6)$

Create a polynomial with the characteristics listed.

27. An odd degree polynomial with zeros at -5, 0, $\frac{2}{3}$ and 10.

28. A polynomial that has three zeros all with different multiplicities.

29. A polynomial that crosses through zeros at -4, and $\frac{1}{2}$, and bounces through the zero of 9.

30. A polynomial with a multiplicity of 8, that bounces off of 3 zeros and crosses through 2 zeros.

Solve the following polynomial inequality.

31. $(2x + 1)^2(x - 3) \leq 0$

32. $x(x + 9)^3(x - 3)^2 > 0$

33. $x^2(3x + 6)(4x - 11)^3 \leq 0$

34. $(5x - 7)^2(x + 12)^2(x - 5) > 0$

Graph the following polynomial. The graph must show accurate zeros and end behavior, as well as behavior AT the zeros (bounce/cross)

35. $f(x) = x(x + 5)(x - 3)^2$

36. $g(x) = 2x(5x + 15)^3(x - 8)^2$

37. $h(x) = (x + 7)(x - 6)^2(x - 1)^3$

38. $k(x) = (2x + 7)^2(x - 2)^2(x + 9)^3$