Course: College Algebra/Pre-Calculus

Instructor: Patterson

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Name of Assignment: College Algebra/Honors Pre-Calc Summer Work

What student will know, understand, or be able to do and why this learning matters: The review problems will give you practice with Alg 2 skills: factoring, simplifying, evaluating and solving equations. These are skills you need to use as you tackle this college level math course.

Directions: (THE FIRST DAY OF CLASS, I WILL CHECK OFF THE REVIEW FOR COMPLETION.)

Purchase the Textbook BEFORE the first day of class!! (You will need the book day 1!!)
PreCalculus Enhanced with Graphing Utilities 7th Edition
Sullivan and Sullivan

- It may be purchased from any source, just be sure it is the Student Version, 7th ed.
- You may purchase the hard cover or electronic textbook.
- If you rent the textbook, beware that it will expire in January and you will need to re-rent the textbook for S2.

Review Assignment: Attached

- For the first time in your life your instructions are to procrastinate!
- Complete the Review Problems in the final month (last week of August even) of summer so that the material/concepts are fresh in your mind for the coming school year.

Important details

- DO WORK ON YOUR OWN PAPER, IN VERTICAL FORMAT AND SHOW YOUR METHOD FOR EACH PROBLEM.
- YOU MAY USE OTHER SOURCES AS NEEDED TO HELP YOU REMEMBER THESE SKILLS I AM ASKING YOU TO REVIEW AND BE READY TO USE.
- You may see me during the first week of school for individual help with the problems.
- It is REQUIRED you have a Graphing Calculator for this course. TI-84 Plus CE calculator is recommended. This is the calculator I will be using in class.

Have a great summer! See you in September!

College Algebra/Honors Pre-Calculus Summer Review Name_____

Due on the first day of school

College Algebra is the first freshman level college course in mathematics; hence a thorough understanding of the material and applications of the concepts is the goal. In order to ensure you are successful from the start of the course, it is important that you have reviewed the fundamental components of Algebra II. This includes

- Algebra Essentials (Inequalities, Domain, Exponents, Roots, Factoring)
- Polynomials
- Rational Expressions
- Solving Equations
- Complex Numbers
- Roots and Rational Exponents

You are to complete this packet and turn it in on the first day of school. It will be scored and entered.
You may use the internet, Algebra textbook, friends and tutors as guides as needed to complete the packet. The intention is for you to review and learn the material that will be essential for your success in this course.

You must show your work, simplify, and box your answers. Calculators are allowed.

Evaluate if x = -2 and y = 4:

1. $-2x + xy$
2. $\dfrac{3x+2y}{y}$
3. $|x-y|$
4. $|x|-|y|$
5. $\big||4x|-|5y|\big|$
6. $-3x^{-1}y$
7. $(x+y)^2$
8. $\sqrt{x^2+y^2}$
9. $\left(\dfrac{5x^{-2}}{6y^{-2}}\right)^{-3}$

Determine the domain of each expression:

10. $\dfrac{x-2}{x-6}$
11. $\dfrac{x}{x^2-9}$
12. $\dfrac{x^2+5x-10}{x^3-x}$

Simplify each expression:

13. $3^{-6}\cdot 3^4$
14. $\dfrac{(-2)^3x^4(yz)^{-1}}{3^2xy^3z}$

Express your answer as a single polynomial in standard form:

15. $\left(x^2-3x-4\right)-\left(x^3-3x^2+x+5\right)$

16. $4x^2\left(x^3-x+2\right)$

17. $\left(2x-3\right)\left(2x+3\right)$

18. $\left(3x-4\right)^2$

19. $3x^3-x^2+x-2$ divided by x + 2

20. $5x^4-x^2+x-2$ divided by x^2 + 2

Factor Completely. If the polynomial cannot be factored, say it is prime.

21. $2-8x^2$

22. $x^2-10x+21$

23. $3x^2-12x+15$

24. $9x^2-12x+4$

25. $5+16x-16x^2$

26. $x\left(x+3\right)-6\left(x+3\right)$

27. $(3x-2)^3-27$

28. x^3-3x^2-x+3

29. $2x(2x+5)+x^2\cdot 2$

Simplify:

30. $\dfrac{4x^2+8x}{12x+24}$

31. $\dfrac{x^2+4x+4}{x^2-4}$

32. $\dfrac{3}{2x}\cdot\dfrac{x^2}{6x+10}$

33. $\dfrac{6x-27}{5x}\cdot\dfrac{2}{4x-18}$

34. $\dfrac{\dfrac{x-2}{4x}}{\dfrac{x^2-4x+4}{12x}}$

35. $\dfrac{3x}{x-4}+\dfrac{2x}{x+3}$

36. $\dfrac{\dfrac{x^2+7x+6}{x^2+x-6}}{\dfrac{x^2+5x-6}{x^2+5x+6}}$

37. $\dfrac{x}{x-3}-\dfrac{x+1}{x^2+5x-24}$

38. $\dfrac{4+\dfrac{1}{x^2}}{3-\dfrac{1}{x^2}}$

39. $\dfrac{\dfrac{2x+5}{x}-\dfrac{x}{x-3}}{\dfrac{x^2}{x-3}-\dfrac{(x+1)^2}{x+3}}$

Solve each equation or inequality:

40. $5-(2x-1)=10$

41. $\dfrac{-2}{x+4}\geq\dfrac{-3}{x+1}$

42. $|3x-1|<2$

43. $v^2+7v+12=0$

44. $\dfrac{5}{x+4}=4+\dfrac{3}{x-2}$

Solve by completing the square.

45. $x^2-6x=13$

46. $2x^2-3x-1=0$

47. **Find the real solutions.** $4t^2+t+1=0$

Simplify. Write each expression in the standard form *a+bi*:

48. $(-8+4i)-(2-2i)$

49. $3i(-3+4i)$

50. $(-3+i)(3+i)$

51. $\dfrac{2-i}{-2i}$

52. i^{14}

53. $4+i^3$

Solve each equation in the complex number system:

54. $x^2+4x+8=0$

55. $x^2-x+1=0$

Simplify. Assume all variables are positive when they appear:

56. $\sqrt[3]{-8x^4}$

57. $\sqrt[3]{\dfrac{3xy^2}{81x^4y^2}}$

58. $\sqrt{5x}\sqrt{20x^3}$

60. $\left(5\sqrt{8}\right)\left(-3\sqrt{3}\right)$

61. $2\sqrt{12}-3\sqrt{27}$

62. $3x\sqrt{9y}+4\sqrt{25y}$

63. $\left(\dfrac{8}{27}\right)^{-2/3}$

Rationalize the expression:

64. $\dfrac{\sqrt{2}}{\sqrt{7}+2}$

65. $\dfrac{\sqrt{3}-1}{2\sqrt{3}+3}$

Solve each equation.

66. $\log_x 64=3$

67 $\log_4(2x+-1)=\log_4 16$

68. $\log_5 0.2=x$

69. $3^{5x}=85$

70. $5^{1-2x}=5^{2x}$