Honors Pre-Calculus
Review Packet
Summer 2020

To all prospective Honors Pre-Calculus students:

Honors Pre-Calculus promises to be a challenging endeavor that will force you to think critically and analytically. It will be a rigorous course that involves a lot of independent discovery, formulation of hypotheses, and proof of theorems.

To best start off the new school year in September, you are asked to complete the attached worksheet and be prepared to turn it in on the first full day of class. The questions in the packet focus on the skills you were taught in Algebra 2 and those which will be most beneficial to you in Pre-Calculus. Some of the more important topics include factoring all types of polynomials, simplifying radicals, and solving equations. Some problems may be a bit involved, so it is not a good idea to wait until the last minute.

Work needs to accompany each problem and all answers should be in simplified form. This packet is due at the beginning of the first class in September and will be counted as a grade. Any assignment turned in late will lose 5 points each day it is not turned in.

If you have any questions regarding the assignment feel free to e-mail me during the summer at twaltrich@gmahs.org. This is not my primary e-mail address, so a response may take a little time. Also, please do not wait until the last week of summer vacation to e-mail me. I cannot guarantee that I will be able to respond in a timely fashion.

Enjoy your summer vacation and your math packet. I look forward to a great school year starting in September.

Mr. Waltrich

Your Name _____

Evaluate the following expressions. Leave answers as improper fractions, no decimals.

1. $\frac{2x}{3} + 2x$ 2. $\frac{11b}{6} + 2b$ 3. $z - \frac{z}{4}$ 4. $2m - \frac{m}{3}$

1. _____ 2. _____ 3. _____ 4. _____

5. $\frac{\pi}{6} + \pi$ 6. $\frac{\pi}{4} + \pi$ 7. $2\pi - \frac{\pi}{4}$ 8. $2\pi - \frac{\pi}{6}$

5. _____ 6. _____ 7. _____ 8. _____

Simplify the following statements, leaving only positive exponents when necessary. Give exact answers only, no decimals.

9. $\sqrt{5} \bullet \sqrt{25}$ _____

10. $\frac{\sqrt{72}}{\sqrt{2}}$ _____

11. $\left(\frac{3^2}{5^2}\right)^{-3}$ _____

12. $6^{-4}(-3)^5$ _____

13. $2(27)^{\frac{2}{3}}$ _____

14. $\left(\frac{25}{16}\right)^{-\frac{1}{2}}$ _____

15. log 3 – log 8 _____

16. $\frac{log\ 36}{2}$ _____

17. $log_3 u + 5\ log_3 v$ _____

Write in simplest radical form. Give exact answers only, no decimals.

18. $\sqrt{25x^5}$ _____

19. $\sqrt[3]{\frac{2x^3}{27}}$ _____

20. $\sqrt{50} - \sqrt{18}$ _____

21. $(3 - \sqrt{8})(5 + \sqrt{2})$ _____

22. $(3\sqrt{2} - 4\sqrt{6})^2$ _____

23. $\frac{1}{2-\sqrt{3}}$ _____

24. $\frac{5}{-\sqrt{6}-\sqrt{2}}$ _____

Perform the required operations and simplify your answer.

25. $(x^2 - 2x + 1)(x^3 - 1)$ _____

26. $\frac{2x-1}{x+1} \bullet \frac{x^2-1}{2x^2-7x+3}$ _____

27. $\frac{4x-6}{(x-1)^2} \div \frac{2x^2-3x}{x^2+2x-3}$ _____

28. $\frac{2}{x} - \frac{3}{x-1} + \frac{4}{x+1}$ _____

29. $\frac{\frac{1}{2x-3} - \frac{1}{2x+3}}{\frac{1}{2x} - \frac{1}{2x+3}}$ _____

30. $\sqrt{-75}$ _____

31. $(3 + 2i) - (6 + 13i)$ _____

32. $(1 + 6i)(5 - 2i)$ _____

33. $\frac{4}{-3i}$ _____

34. $\frac{3+2i}{5+i}$ _____

Factor <u>completely</u>.

35. $3x^2 + 14x + 8$ _____

36. $x^3 - 1$ _____

37. $27y^2 - 12$ _____

38. $9x^4 + 32x^2 - 16$ _____

39. $x^3 - x^2 + 2x - 2$ _____

Solve each equation.

40. $3x - 2(x + 5) = 10$ _____

41. $\frac{1}{2}(x - 3) - 2(x + 1) = 5$ _____

42. $\frac{1}{x-2} = 3$ _____

43. $6x = 3x^2$ _____

44. $3x^2 + 1 = 0$ _____

45. $6x^2 = 5x + 4$ _____

46. $x^2 + 6x - 3 = 0$ _____

47. $12x^3 - 84x^2 + 120x = 0$ _____

48. $\frac{4}{x-3} - \frac{4}{x} = 1$ _____

49. $\sqrt{x-2} - 8 = 0$ _____

50. $\sqrt{2x+3} + \sqrt{x-2} = 2$ _____

51. $|x-5| = 10$ _____

52. $|x^2 - 3| = 2x$ _____

Solve each inequality.

53. $\frac{1}{2}(3-x) > \frac{1}{3}(2-3x)$ _____

54. $\frac{x}{5} - 6 \leq -\frac{x}{2} + 6$ _____

55. $x^2 - 4 \leq 0$ _____

56. $x^2 - 2x \geq 3$ _____

57. $\frac{x-5}{3-x} < 0$ _____

58. $\frac{2}{x+1} \leq \frac{3}{x-1}$ _____

59. $\left|x - \frac{3}{2}\right| \geq \frac{3}{2}$ _____

60. $|x - 2| < 1$ _____

Write an equation for the line described.

61. passes through (5, -1) and (-5, 5) _____

62. passes through (-6, 4) and is perpendicular to the line $3x + 4y = 7$ _____

Answer the following questions about functions.

63. Find the domain of $f(x) = \frac{x+6}{2x-1}$ _____

64. Find the domain of $f(x) = \sqrt{3x + 6}$ _____

65. Find $f \circ g$ when $f(x) = x^2 - 3x$ and $g(x) = 2x$ _____

66. Find the equation of the inverse of $f(x) = -6x + 5$ _____