

Honors Pre-Calculus Review Packet Summer 2024

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.

The Math Department

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. $\sqrt{5} \cdot \sqrt{25}$

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.

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

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

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

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

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

Perform the required operations and simplify your answer.

$$23. (x^2 - 2x + 1)(x^3 - 1)$$

$$24. \frac{2x-1}{x+1} \cdot \frac{x^2-1}{2x^2-7x+3}$$

25. $\sqrt{-75}$

26. $(3 + 2i) - (6 + 13i)$

27. $(1 + 6i)(5 - 2i)$

28. $\frac{4}{-3i}$

29. $\frac{3+2i}{5+i}$

Factor completely.

30. $3x^2 + 14x + 8$

31. $27y^2 - 12$

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

33. $x^3 - x^2 + 2x - 2$

Solve each equation.

34. $3x - 2(x + 5) = 10$

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

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

37. $6x = 3x^2$

38. $6x^2 = 5x + 4$

39. $x^2 + 6x - 3 = 0$

40. $12x^3 - 84x^2 + 120x = 0$

Write an equation for the line described.

41. passes through (5, -1) and (-5, 5)

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

Answer the following questions about functions.

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

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

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

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