

PERTH AMBOY HIGH SCHOOL

300 Eagle Avenue ~ Perth Amboy, New Jersey 08861

732-376-6030 (voice) ~ 732-347-8930 (facsimile)

Eugene G. Mosley, Principal

Sylvia León, Meghan G. Reeves, Brian Rivera, ~ Vice Principals

Luis Ortega, Vice Principal of the Education Center (PLA)

Calculus 1-Honors Summer Assignment 2016

Name: _____ HR _____

Email address: _____

Welcome to Calculus 1-Honors!!! As you enter Calculus 1, it is expected that you have mastered the content in the courses from Algebra to Pre-Calculus as this is important to your success in Calculus 1. You will discover that many times you will be able to do the Calculus 1 coursework, only to find the final answer is incorrect due to an algebraic error in your work.

In order for you to be successful in Calculus 1-Honors, you need to review some of the essential pre-requisite skills. These skills are the culmination of all the mathematics you have ever had and are contained in this summer assignment.

When you come across a topic that requires a little more review, feel free to search a website, call a friend or email me your questions. Relevant websites can be found at:

- <http://patrickjmt.com>
- <http://www.khanacademy.org>
- www.mastermathmentor.com
- <https://www.youtube.com/user/TheIntegralCALC>

- ✓ ***You must do each of the problems without a calculator, showing ALL steps which lead to the solution in an organized manner.***
- ✓ ***Show all work on every problem to receive credit. Circle all answers.***
- ✓ ***All work must be done in pencil (No pens).***

For the first day of class, you will need a 1.5" binder, a double pocket folder, and lot of sharpen pencils. Calculus 1-Honors is a fast paced and challenging course. It is extremely important to be organized and always prepared for class.

This packet is due on September 9th. The content contained in this packet is pre-requisite knowledge for Calculus 1-Honors. There will be a test within the first week back to school.

If you have question you can email me at giriponnappalli@paps.net or samucerritos@paps.net.

Enjoy your summer. Looking forward to seeing you in September 6, 2016!

Yours in Education,

Mrs. Ponnappalli [<http://www.paps.net/Domain/1183>]

Mr. Cerritos [<http://www.paps.net/Domain/2248>]

Calculus 1—Honors

Students should practice each of the following skills to prepare for the Calculus 1-Honors. This material represents an expectation of skills and concepts for calculus students. Attach all work if using separate sheets of paper. Work is to be completed on college lined paper (trim the edges) and in pencil. No exceptions.

Factoring:

Factor each expression completely.

1. $x^3 + 8$
2. $x^3 - 8$
3. $x^2 + 11x - 80$
4. $ac + cd - ab - bd$
5. $2x^2 + 50y^2 - 20xy$
6. $(x-3)^2(2x+1)^3 + (x-3)^3(2x+1)^2$
7. $6x^5 - 51x^3 - 27x$
8. $3x^3 - 2x^2 - 12x + 8$

Simplifying Expressions:

Simplify each expression. Write answers with positive exponents where applicable.

9. $(4a^{\frac{5}{3}})^{\frac{3}{2}}$
10. $\frac{x^2}{\frac{10}{x^3}}$
11. $\frac{\frac{1}{2} - \frac{5}{4}}{\frac{3}{8}}$
12. $\frac{12x^{-3}y^2}{18xy^{-1}}$
13. $\frac{5-x}{x^2-25}$
14. $\frac{15x^2}{5\sqrt{x}}$
15. $\frac{\frac{25}{a} - a}{5+a}$
16. $2 - \frac{4}{x+2}$
 $5 + \frac{10}{x+2}$
17. $\frac{\frac{4}{x^2-9} + \frac{2}{x-3}}{\frac{1}{x+3} + \frac{1}{x-3}}$
18. $\frac{36}{\frac{1}{x} + \frac{7}{2x}}$

Rational Equations:

Solve each rational equation.

19. $\frac{2}{3} - \frac{5}{6} = \frac{1}{x}$
20. $\frac{x-5}{x+1} = \frac{3}{5}$
21. $\frac{2}{x+5} + \frac{1}{x-5} = \frac{16}{x^2-25}$
22. $\frac{x}{2x-6} - \frac{3}{x^2-6x+9} = \frac{x-2}{3x-9}$

Functions:

Evaluate each of functions at the given values.

Let $f(x) = 2x+1$ and $g(x) = 2x^2-1$


23. $f(2) =$
24. $g(-3) =$
25. $f(t+1) =$
26. $f(g(-2)) =$
27. $g(f(m+2)) =$
28. $\frac{f(x+h) - f(x)}{h}$

Let $f(x) = x^2$, $g(x) = 2x+5$, and $h(x) = x^2-1$

29. $f(g(x-1)) =$
30. $\frac{f(x+h) - f(x)}{h}$

Interval Notation:

31. Complete the table below.

Solution	Interval Notation	Graph
$-2 < x \leq 4$		
	$[-1, 7)$	
		

Domain and Range:

Find the domain and range of the function.

32. $f(x) = x^2 - 5$
33. $f(x) = -\sqrt{x+3}$
34. $f(x) = 3\sin x$
35. $f(x) = \frac{2}{x-1}$

Inverses:

Find the inverse of the function.

36. $f(x) = 2x + 1$ 37. $f(x) = \frac{x^2}{3}$

38. What is the relationship of inverses numerically, graphically, and algebraically?

39. Prove that f and g are inverses of each other.

$f(x) = 9 - x^2, x \geq 0$ $g(x) = \sqrt{9 - x}$

Equations of Lines:

Slope Intercept Form: $y = mx + b$

Point-Slope Form: $y - y_1 = m(x - x_1)$

Write the equation of a line with the given attributes.

- 40. Slope is undefined and passes through (5, -3)
- 41. Slope is zero and passes through (-4, 2)
- 42. Passes through (2, 8) and parallel to $y = \frac{5}{6}x - 1$.
- 43. Passes through (4, 7) and perpendicular to y -axis.
- 44. Passes through (-3, 6) and (1, 2)
- 45. Has x -intercept of (2, 0) and y -intercept of (0, 3).

Logarithms:

Complete the following properties for logarithms:

46. $\log_b 1 =$ 47. $\log_b b =$ 48. $\log_b b^x =$

49. $\log_b uv =$ 50. $\log_b \frac{u}{v} =$ 51. $\log_b u^n =$

Evaluate without a calculator.

52. $\log_4 64$ 53. $\log_8 \frac{1}{2}$

54. $\ln e^8$ 55. $\log_{1/3} 27$

Solve.

56. $12 = 10^{x+5} - 7$ 57. $5 - \ln x = 7$

58. $3e^{-x} - 4 = 9$ 59. $5 \log_3(x - 2) = 10$

Trigonometry

Fill out the unit circle, and evaluate each trigonometric function exactly without a calculator.

60. $\sin \pi$ 61. $\cos \frac{5\pi}{4}$ 62. $\sin\left(-\frac{\pi}{2}\right)$

63. $\sin \frac{11\pi}{6}$ 64. $\tan \frac{2\pi}{3}$ 65. $\sec \frac{7\pi}{6}$

66. $\tan \frac{\pi}{2}$ 67. $\csc \frac{\pi}{3}$

