

Name \_\_\_\_\_

Date \_\_\_\_\_

Period \_\_\_\_\_

**Miami Palmetto Senior High School  
Mathematics Department  
Summer Review Assignment Packet**

**DUE THE FIRST DAY OF SCHOOL**

**To all AP Calculus AB students:**

This is an assignment for students who will be entering AP Calculus AB in the fall. These problems cover most of the concepts taught in the Algebra Two courses which students are expected to *know* in order to do well in the AP Calculus AB course. It is very important to master these skills because they will be applied throughout the AP Calculus AB course. Students with a weak foundation in Algebra 2 coursework struggle in AP Calculus AB. We highly recommend each student work on these problems throughout the summer and come prepared for the AP Calculus AB class. Since the students have taken Algebra 2, they are expected to have the necessary background and skills required to solve these problems. Students should bring the completed packet with them to turn in to Mrs. Kaplan on the first day of next school year. Late packets will not be accepted. Neat and logical process steps must be shown for each problem. The assignment will be reviewed during the first week of school. Students will be tested over the material at the beginning of the second week of school.

**Reflection**

***Answer the following questions in complete sentences, written neatly or typed. Please be honest, as there is no right or wrong answer.***

1. How long did it take you to complete this packet?
2. Did you complete the work alone or did you work with friends? What resources did you use? (i.e. books, internet or human help)
3. Which topic from the packet did you think was the easiest? Please explain why it was easy for you and include an example.

4. Which topic from the packet was hardest for you? Please explain why it was difficult for you and include an example.
  
5. What do you think is your greatest strength in mathematics? How do you use it to your advantage?
  
6. What do you think is your greatest weakness in mathematics? What strategies do you use to help you overcome it?
  
7. Describe your previous experiences in math classes. Include information about how you learn best, any extra help you used in the past, work ethic and anything else you think has influenced your learning.

**Parents are requested to see that this assignment is completed to ensure success of their child in the AP Calculus AB class.**

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Parent printed name

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Student printed name

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I. Simplify. Show the work that leads to your answer.

1.  $\frac{x-4}{x^2-3x-4}$

2.  $\frac{x^3-8}{x-2}$

3.  $\frac{5-x}{x^2-25}$

4.  $\frac{x^2-4x-32}{x^2-16}$

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II. Complete the following identities.

1.  $\sin^2x + \cos^2x =$  \_\_\_\_\_

2.  $1 + \tan^2x =$  \_\_\_\_\_

3.  $\cot^2x + 1 =$  \_\_\_\_\_

4.  $\cos 2x =$  \_\_\_\_\_

5.  $\sin 2x =$  \_\_\_\_\_

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III. Simplify each expression.

1.  $\frac{1}{x+h} - \frac{1}{x}$

2.  $\frac{\frac{2}{x^2}}{\frac{10}{x^5}}$

3.  $\frac{\frac{1}{3+x} - \frac{1}{3}}{x}$

4.  $\frac{2x}{x^2-6x+9} - \frac{1}{x+1} - \frac{8}{x^2-2x-3}$

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IV. Solve for z:

1.  $4x + 10yz = 0$

2.  $y^2 + 3yz - 8z - 4x = 0$

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V. If  $f(x) = \{(3,5), (2,4), (1,7)\}$

$g(x) = \sqrt{x-3}$

$h(x) = \{(3,2), (4,3), (1,6)\}$

$k(x) = x^2 + 5$

determine each of the following:

1.  $(f + h)(1) =$  \_\_\_\_\_

2.  $(k - g)(5) =$  \_\_\_\_\_

3.  $(f \circ h)(3) =$  \_\_\_\_\_

4.  $(g \circ k)(7) =$  \_\_\_\_\_

5.  $f^{-1}(x) =$  \_\_\_\_\_

6.  $k^{-1}(x) =$  \_\_\_\_\_

VI. Miscellaneous: Follow the directions for each problem.

1. Evaluate  $\frac{f(x+h)-f(x)}{h}$  and simplify if  $f(x) = x^2 - 2x$ .

2. Expand  $(x + y)^3$

3. Simplify:  $x^{\frac{3}{2}}(x + x^{\frac{5}{2}} - x^2)$

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VIII. Simplify

1.  $\frac{\sqrt{x}}{x}$  \_\_\_\_\_ 2.  $e^{\ln 3}$  \_\_\_\_\_

3.  $e^{(1+\ln x)}$  \_\_\_\_\_ 4.  $\ln 1$  \_\_\_\_\_

5.  $\ln e^7$  \_\_\_\_\_ 6.  $\log_3(1/3)$  \_\_\_\_\_

7.  $\log_{1/2} 8$  \_\_\_\_\_ 8.  $\ln \frac{1}{2}$  \_\_\_\_\_

9.  $e^{3 \ln x}$  \_\_\_\_\_ 10.  $\frac{4xy^{-2}}{12x^{\frac{1}{3}}y^{-5}}$  \_\_\_\_\_

11.  $27^{2/3}$  \_\_\_\_\_ 12.  $(5a^{2/3})(4a^{3/2})$  \_\_\_\_\_

13.  $(4a^{5/3})^{3/2}$  \_\_\_\_\_

IX. Using the point-slope form  $y - y_1 = m(x - x_1)$ , write an equation for the line

1. with slope  $-2$ , containing the point  $(3, 4)$       1. \_\_\_\_\_

2. containing the points  $(1, -3)$  and  $(-5, 2)$       2. \_\_\_\_\_

3. with slope  $0$ , containing the point  $(4, 2)$       3. \_\_\_\_\_

4. perpendicular to the line in problem #1, containing the point  $(3, 4)$       4. \_\_\_\_\_

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XI. **Without** a calculator, determine the exact value of each expression.

1.  $\sin 0$  \_\_\_\_\_      2.  $\sin \frac{\pi}{2}$  \_\_\_\_\_      3.  $\sin \frac{3\pi}{4}$  \_\_\_\_\_

4.  $\cos \pi$  \_\_\_\_\_      5.  $\cos \frac{3\pi}{4}$  \_\_\_\_\_      6.  $\cos \frac{\pi}{3}$  \_\_\_\_\_

7.  $\tan \frac{7\pi}{4}$  \_\_\_\_\_      8.  $\tan \frac{\pi}{6}$  \_\_\_\_\_      9.  $\tan \frac{2\pi}{3}$  \_\_\_\_\_

10.  $\cos(\sin^{-1} \frac{1}{2})$  \_\_\_\_\_      11.  $\sin^{-1}(\sin \frac{7\pi}{6})$  \_\_\_\_\_

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XII. For each function, determine its domain and range.

Function	Domain	Range
1. $y = \sqrt{x-4}$	_____	_____
2. $y = \sqrt{x^2-4}$	_____	_____
3. $y = \sqrt{4-x^2}$	_____	_____
4. $y = \sqrt{x^2+4}$	_____	_____

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XIII. Determine all points of intersection.

1. parabola  $y = x^2 + 3x - 4$  and  
line  $y = 5x + 11$

2.  $y = \cos x$  and  $y = \sin x$  in the  
first quadrant

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XIV. Solve for  $x$ , where  $x$  is a real number. Show the work that leads to your solution.

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

2.  $\frac{x^4 - 1}{x^3} = 0$

3.  $(x - 5)^2 = 9$

4.  $2x^2 + 5x = 8$

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Solve for  $x$ , where  $x$  is a real number. Show the work that leads to your solution.

5.  $(x + 3)(x - 3) > 0$

6.  $x^2 - 2x - 15 \leq 0$

7.  $12x^2 = 3x$

8.  $\sin 2x = \sin x$ ,  $0 \leq x \leq 2\pi$

9.  $|x - 3| < 7$

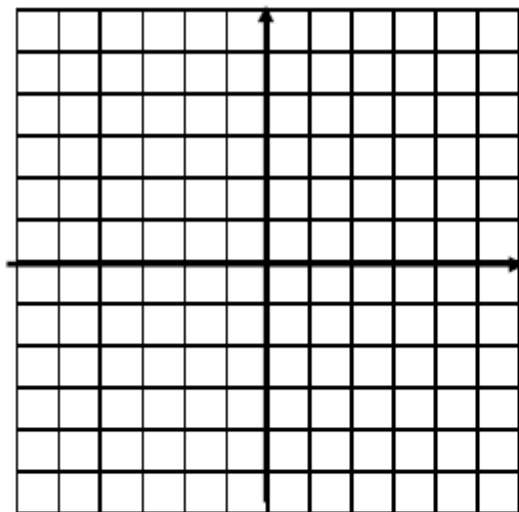
10.  $(x + 1)^2(x - 2) + (x + 1)(x - 2)^2 = 0$

11.  $27^{2x} = 9^{x-3}$

12.  $\log x + \log(x - 3) = 1$

XV. Graph each function. Give its domain and range.

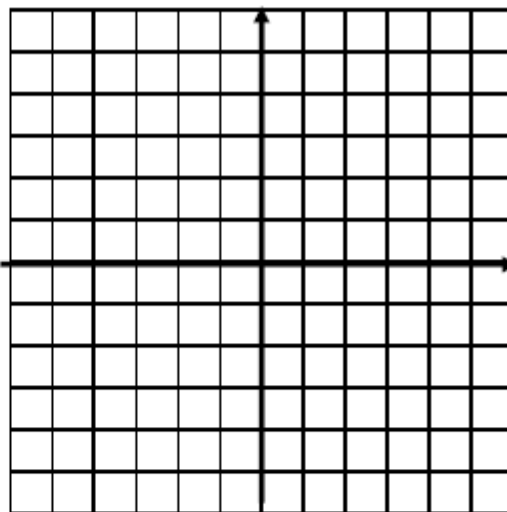
1.  $y = \sin x$



Domain \_\_\_\_\_

Range \_\_\_\_\_

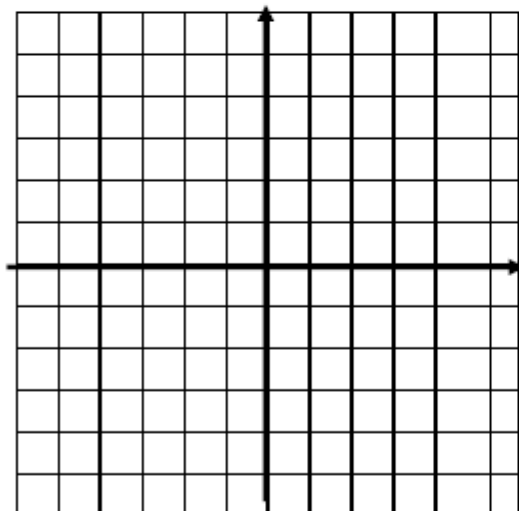
2.  $y = e^x$



Domain \_\_\_\_\_

Range \_\_\_\_\_

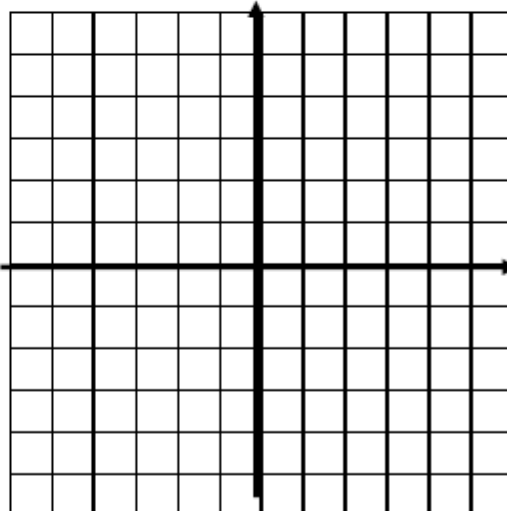
3.  $y = \sqrt{x}$



Domain \_\_\_\_\_

Range \_\_\_\_\_

4.  $y = \sqrt[3]{x}$



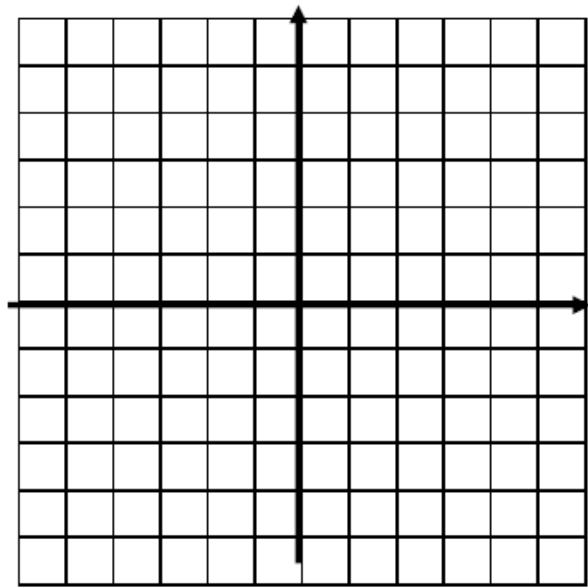
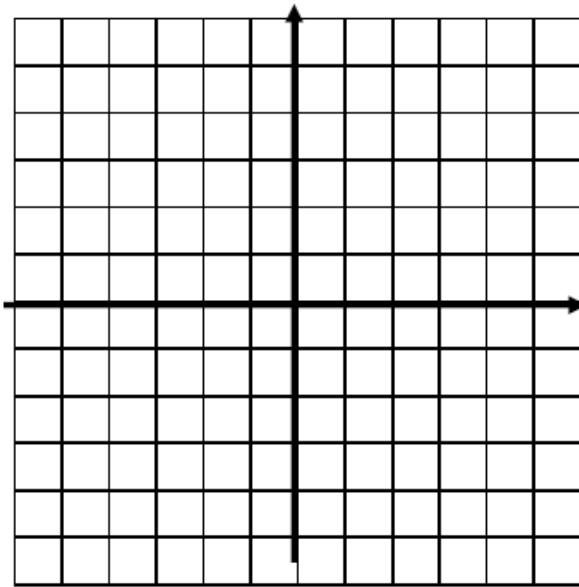
Domain \_\_\_\_\_

Range \_\_\_\_\_

Graph each function. Give its domain and range.

5.  $y = \ln x$

6.  $y = |x + 3| - 2$



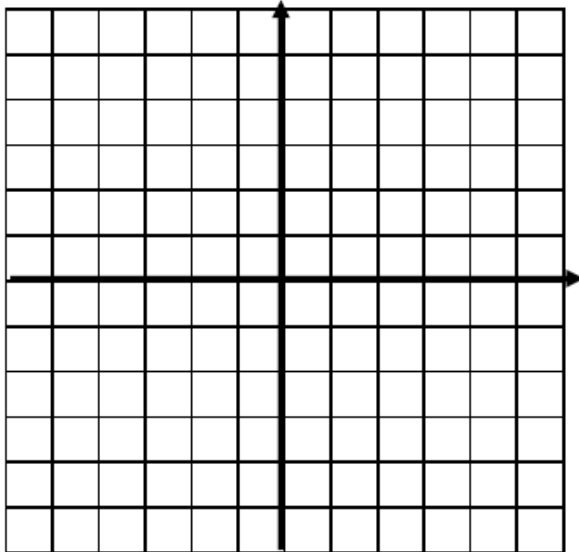
Domain \_\_\_\_\_

Domain \_\_\_\_\_

Range \_\_\_\_\_

Range \_\_\_\_\_

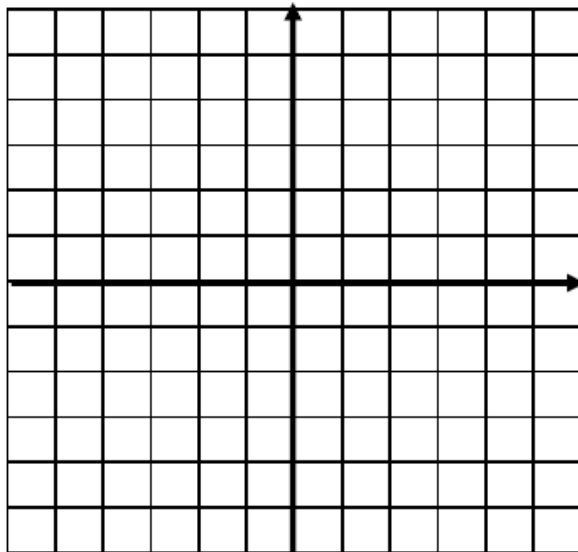
7.  $y = \frac{1}{x}$



Domain \_\_\_\_\_

Range \_\_\_\_\_

8.  $y = \begin{cases} x^2 & \text{if } x < 0 \\ x + 2 & \text{if } 0 \leq x \leq 3 \\ 4 & \text{if } x > 3 \end{cases}$



Domain \_\_\_\_\_

Range \_\_\_\_\_

***Congratulations!*** You have finished the calculus summer packet. Please use the space below if you would like to make some comments to your calculus teacher concerning the packet.