AP Calculus AB/Calculus I Honors
Summer Assignment 2019

Welcome to Calculus! As you enter calculus, 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. You will discover that many times you will be able to do the calculus work, only to find the final answer is incorrect due to an **algebraic** error in your work.

MOST IMPORTANT

- **Memorize the trigonometric functions of the basic angles. Learn the "Hand Trick!"**
- **Make sure you can recognize the graphs of all parent functions. AND you practice basic algebraic skills.**

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

✓ **You must do each of the problems without a calculator, showing ALL steps which lead to the solution in an organized manner.**

✓ **Circle all answers. If you need extra space, use the back of the page.**

✓ **All work must be done in pencil (No pens).**

✓

Remember that by enrolling in this course, you are making a commitment to excellence in daily work. Work must be legible, well organized and solutions clearly labeled. You should show and/or explain how you arrived at all answers. Please do not wait until the last day of vacation to get started.

Calculus is a fast paced course that is taught at the college level. Therefore, we cannot spend a lot of class time re teaching

prerequisite skills. Spend some time with these skills and make sure you are clear on everything covered in the packet so that you will be successful in Calculus.

Successful students in Calculus possess the following characteristics:

- Daily review of new content
- Diligent completion of homework on a daily basis
- Participation in study groups
- Understanding concepts VS cramming details
- Organizing notes and materials
- Asking questions in class and out of class before next concept is introduced

This packet is due on Thursday, September 5, 2019.

Enjoy your summer. If you have question you can email me at giriponnapalli@paps.net.

Looking forward to seeing you in September!

Mrs. Ponnapalli & Mr. Cerritos

AP Calculus AB/Calculus I Honors Summer Assignment Name_____

<u>This assignment will be collected on the first day of school.</u> No excuses!!!!

$y - y_1 = m(x - x_1)$

1] A line passes through the points (–4, –6) and (8, 4).

a) Use point-slope form to write the equation of the line that is perpendicular to the given line at the point (2, –1).

b) Use point-slope form to write the equation of the line that is parallel to the given line at the point (–2, 5).

2] A high diver jumps off a springboard. Her height above the water is given by $h(t) = -4t^2 + 8t + 10$ where **h** is in meters and **t** in seconds.

a) What is her maximum height and when does it occur?

b) When does the diver hit the water?

c) When does the diver return to her initial height?

3] Factor completely:

a) $3x^2 - 5x - 8$

b) $4x^3 - 8x^2 - 25x + 50$

c) $x^3 - 64$

d) $(x+1)^3(4x-9) - (16x+9)(x+1)^2$

4] Simplify:

a) $\frac{x+1}{x} - \frac{x}{x+1}$

b) $\frac{x}{1+\sqrt{x+1}}$

5] Find the zeros of each of the following:

a) $0 = x^3 - 12x^2 + 27x$

b) f(x) = $\dfrac{x^2 - 3x + 2}{x^2 - 1}$

c) $2(x-5)^{-1} + \dfrac{1}{x} = 0$

6] Given: f(x) = $x^2 - 5x + 8$

a) Find: f(a)

a) f(a + h)

b) $\dfrac{f(a+h) - f(a)}{h}$

7] Use the table to evaluate each of the following:

x	f(x) = x^2 − 2x − 3		x	g(x) = 2x − 3
−1	0		−1	**−5**
0	−3		0	**−3**
1	−4		1	**−1**
2	−3		2	**1**
3	0		3	**3**
4	**5**		**4**	**5**

a) f(g(2))

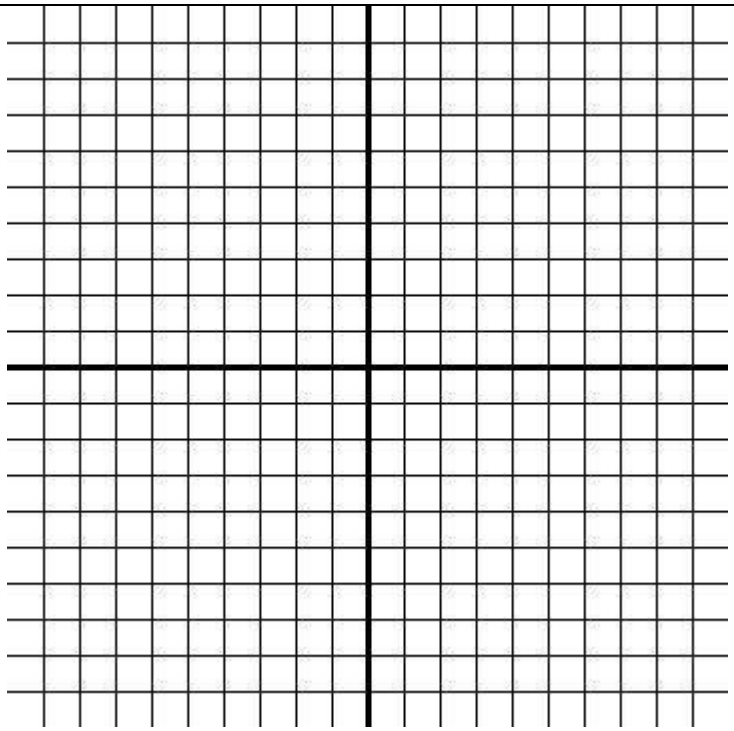
b) g(f(-1))

c) $g \circ f \circ g(3)$

d) Are f(x) and g(x) are inverse to each other? How do we check?

8] Graph this piecewise function:

$$h(x)=\begin{cases} x+3 & \text{if } x<-2 \\ x^2 & \text{if } -2\le x<1 \\ -x+2 & \text{if } x\ge 1 \end{cases}$$



a) What is the value of 3h (1)?

b) What is the value of h (–7)?

c) What is the value of 4h(–6) + *5h* (0)?

9] Find all exact solutions on the domain $[0, 2\pi)$ a) $2 \cos x + 2 \sin x \cos x = 0$ b) $\cos^2 x - \sin^2 x = \sin x$	10] Find the exact value of each expression: a) $\cos 210^\circ$ b) $\sin \frac{5\pi}{4}$ c) $\sin^{-1} \frac{\sqrt{3}}{2}$ d) $\tan \frac{2\pi}{3}$

11]

f(x)= $\dfrac{x^3-2x^2}{x^3-3x^2-4x+12}$

a) Find the zeros

b)vertical and horizontal asymptotes

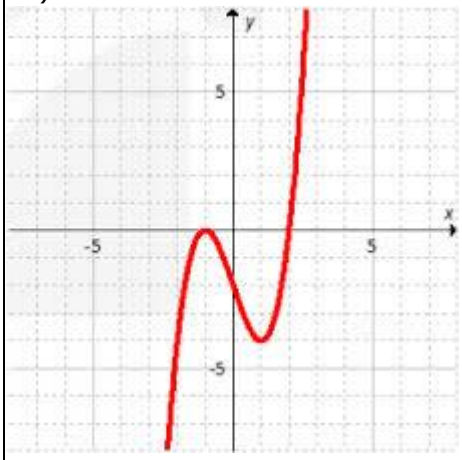
c)domain

12) Find the inverse of each of the following

a) f(x) = $\dfrac{4x}{x-1}$

b)f(x) = $\sqrt{x-2}$

13)



a) On what intervals is the function increasing? And decreasing?

b) What is the max/min values?

The graphs of the 12 basic Functions

14)
Sketch each graph. What is the graph's proper name?

f(x)=x

f(x)= x^2

f(x) = x^3

$f(x) = \sqrt{x}$

f(x) = $\frac{1}{x}$

f(x) = $\frac{1}{x^2}$

f(x) = $|x|$

f(x) = e^x

f(x) = ln x

f(x) = k

f(x) = sin x

f(x) = cos x

15)

Simplifying Expressions:

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

1. $\left(4a^{\frac{5}{3}}\right)^{\frac{3}{2}}$

2. $\dfrac{12x^{-3}y^{2}}{18xy^{-1}}$

3. $\dfrac{\frac{1}{2}-\frac{5}{4}}{\frac{3}{8}}$

4. $\dfrac{15x^{2}}{5\sqrt{x}}$

5. $\dfrac{5-x}{x^{2}-25}$

6. $\dfrac{2-\dfrac{4}{x+2}}{5+\dfrac{10}{x+2}}$

Evaluate without a calculator.

a) $\log_4 64$

b) $\log_8 \frac{1}{2}$

b) $\ln e^8$

d) $\log_{\frac{1}{3}} 27$