

# AP Calculus AB – Summer Preparation

GW Community School – 2018-2019 School Year

In order to be prepared for AP Calculus at the beginning of school in September 2018 each student must have their own Graphing Calculator and must know how to use it to perform certain tasks. Students cannot rely on using their computer or cell phone to perform these functions. There is a wide variety of graphing calculators and most any could be used but the student must know how to use their own calculator before the beginning on the course. If you plan to purchase a new graphing calculator I would encourage you to select one with a CAS (Computer Algebra System).

Students may learn to use their calculators from user manuals, YouTube videos, web pages and other sources. Students should make sure they are able to perform the following functions on their own calculator.

1) Analyzing the graph of a function.

a) Graph the following function:

$$f(x) = 6x^4 - 7x^3 - 134x^2 + 35x + 300$$

b) Adjust the window settings to display all intercepts and relative extrema.

c) Use the calculator functions to find all the intercepts and relative extrema. List and label those points.

2) Finding a model to match data.

A basketball is dropped from a height of about 5¼ feet. The height of the basketball is recorded 8 times at intervals of about 0.06 seconds. The results are shown in the table below:

Time	0.0	0.06	0.119996	0.179988	0.23998	0.299976	0.359961	0.419941
Height	5.23594	5.0991	4.85062	4.50132	4.02958	3.44981	2.76921	1.98058

a) Enter the data from the table into your calculator.

b) Graph a plot of the points that shows all 8 points.

c) Use the regression feature of your calculator to find a quadratic model that fits this data.

3) Investigating the Number  $e$ .

a) Enter the following function into your calculator:

$$f(x) = (1 + x)^{1/x}$$

b) Use the table function to display the function values for the following values of  $x$ :

$x$	-0.01	-0.001	-0.0001	0.0001	0.001	0.01
$(1 + x)^{1/x}$						

4) Simultaneous graphs.

a) Graph the following two functions on the same screen that shows the essentials of the shapes.

$$f(x) = \frac{5x - 2}{x^2 + 1}$$

$$g(x) = \frac{-5x^2 + 4x + 5}{(x^2 + 1)^2}$$

b) Use the calculator feature to find the point of intersection.

Thank you. I look forward to seeing you in September.

Gary T. Lindner

GWCS Calculus Teacher