I. Purchase your calculus text, <u>Single Variable Calculus with Vector Functions (AP edition), 7th ed.</u>, James Stewart, ISBN 978-0-8400-4823-3, early in the summer. Please be sure to get this exact edition, as there are several similar versions of this textbook. Please work on the written portion of your summer assignment at a leisurely, not frantic, pace. The assignment is long (get used to it) and you'll need to spread it out over several weeks during the summer. Its intent is twofold: to keep mathematical ideas fresh in your minds and to make sure you know the basics well enough to hit the ground running.

II. Take Diagnostic Tests A-D on pages xxiv-xxviii. Show all of your work. After completing each test, check your answers, then find out why you missed any that you got wrong by checking your old textbooks, notes, online resources, other class members, etc.

III. You will be working through Appendices A-E & G on pages A2-A39 & A46-A52, completing some of the exercises. In many cases I've chosen pairs of questions where odd & even exercises are similar. This way you can check your answers to the odd numbered exercises in the back of the book (beginning on p. A112) before attempting the even numbered exercises that I will be spot checking to evaluate your understanding of the material (and perhaps preparing remedial lessons if there are many students who have difficulty with particular concepts). Complete the following exercises from the text. If you have trouble with the exercises, please call someone else who is going to be in the class, and try to work them out together.

Section Assignment
App. A   p. A9-A10 9, 10, 19, 20, 23, 24, 27, 28, 35-38, 45, 46, 49, 50, 55, 56, 63, 65, 67, 69, 70
App. B   p. A15-A16 7, 8, 11, 12, 25, 27, 33, 36, 41, 53, 54, 56, 58, 59, 62
App. C   p. A23 1, 2, 5, 6, 27, 29, 30, 33, 34
App. D   p. A32-A33 1, 2, 7, 8, 13, 14, 17-20, 23-36, 42, 43, 46, 47, 52, 59, 60, 63-65, 69, 70, 77, 78, 82, 88
App. E   p. A38 3-6, 13, 14, 19, 21, 22, 31, 32
App. G   p. A51-52 19-22, 27, 37

IV. Read "Principles of Problem Solving" on pages 97-99 (example 1 only).

V. Read "To the Student" on pages xxii-xxiii to become oriented to conventions that the author uses in the text.

VI. Read "A Preview of Calculus" on pages 1-8.

VII. Read section 1.1, then re-read it before the first lecture (2nd day of school). I will be asking you throughout the course to pre-read sections before I lecture on them. The purpose of these readings is to expose you to the concepts & vocabulary, certainly not for you to teach yourself the concepts!

VIII. Study for the pretest, to be taken on the first day of school. It will cover the above material as well as other topics listed on the other side of this sheet. The test will count as your first major grade. Note that Reference Pages 1-4 at the back of the textbook contain useful formulae from algebra, geometry and trigonometry.

IX. Make sure you are very familiar with using your graphing calculator. (Yes they do come with manuals.)

X. Please take this summer assignment very seriously. It will count as a major homework assignment. To help you to pace yourself, I am asking that you mail (or hand deliver) portions of the assignment to the school (109 Burns Crossing Rd, Severn, MD 21144) or scan them and then email them to me (cdeterding@aacsonline.org) by the following deadlines. If you scan your work, please send it to me as <u>one</u> file, not one file for each page. Please do <u>not</u> send me pictures of the pages, since the pencil writing may be difficult to read.
Appendix A-B July 2
Appendix C-D August 3
Appendix E & G August 22 (first day of school)

Points will be deducted for assignments received after the due dates.

The following topics and skills are considered to be a bare minimum for success in Calculus. You should be well versed in all of the topics from geometry, algebra 2, and precalculus, but especially with the following. We will have a test on the following material on the first day of school.

Geometry

Areas/Surface Areas – circles, cylinder, sphere, cone, prism
Volumes – sphere, cylinder, cone, prism, pyramid

Algebra

Functional notation
Definition of logarithms
Laws of logarithms
Absolute value
Quadratic formula
Completing the square, e.g., $f(x) = 3 + 2x – x^2$
$g(x) = 4x^2 + 4x + 2$
Inequalities, e.g., $x^2 – x – 6 \geq 0$
$x^3 + 2x^2 – 3x < 0$
Distance formula
Fractional exponents
Factoring, including sum and difference of cubes
Slopes of lines; parallel and perpendicular lines
Point-slope & slope-intercept forms of straight lines
Parabolas
Graphs of conics
Complex fractions
Polynomial/ Synthetic division
Translations and dilations, e.g., given $f(x)$, find $f(x–a)$, $f(x) + b$, $f(ax)$, $a\,f(x)$, and combinations thereof.

Trigonometry

Radian measure (we do not use degree measure in calculus)
Law of cosines
All six functions of angles that are multiples of $\pi/2$, $\pi/3$, $\pi/4$ & $\pi/6$
Triangle definitions of trig functions
Inverse trig functions – definitions & range values
You must know the following identities, not simply how to look them up and use them:

$\sec x = 1/\cos x$	$\sin 2x = 2 \sin x \cos x$
$\csc x = 1/\sin x$	$\cos 2x = \cos^2 x – \sin^2 x$, and its equivalent forms
$\cot x = 1/\tan x$	$\sin(A+B) = \sin A \cos B + \cos A \sin B$
$\sin^2 x + \cos^2 x = 1$	$\cos(A+B) = \cos A \cos B – \sin A \sin B$
$\sec^2 x – \tan^2 x = 1$	$\sin(–x) = –\sin x$
$\sec^2 x – 1 = \tan^2 x$	$\cos(–x) = \cos x$
$\tan^2 x + 1 = \sec^2 x$	$y = r \sin \theta$
	$x = r \cos \theta$