AP CALCULUS PREPARATION

The following topics and skills are considered to be a bare minimum for success in Calculus. You should be well versed in <u>all</u> 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.

<u>Geometry</u>

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

<u>Algebra</u>

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.

<u>Trigonometry</u>

Radian measure (we do not use degree measure in calculus)
Law of cosines
All six trig 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 <u>know</u> the following identities, not simply how to look them up and use them:

$\sec x = \frac{1}{\cos x}$ $\sin 2x = 2 \sin x \cos x$

$\csc x = \frac{1}{\sin x}$ $\cos 2x = \cos^2 x - \sin^2 x$, and its equivalent forms

$\cot x = \frac{1}{\tan x}$ $\sin(A+B) = \sin A \cos B + \cos A \sin B$

$\sin^2 x + \cos^2 x = 1$ $\cos(A+B) = \cos A \cos B - \sin A \sin B$

$\sec^2 x - \tan^2 x = 1$ $\sin(-x) = -\sin x$

$\sec^2 x - 1 = \tan^2 x$ $\cos(-x) = \cos x$

$\tan^2 x + 1 = \sec^2 x$ $x = r \cos\theta$ and $y = r \sin\theta$