AP Calculus AB or BC Summer Assigned Work

Textbook Required:
Calculus of a Single Variable, 11th edition
By: Larson/Edwards
ISBN-13: 9781337275361 | ISBN-10: 1337275360

PART 1: Memorization

See the attached list of identities, formulas, factoring patterns, etc… all of which needs to be memorized! Please make and study flashcards of each and be prepared for <u>daily quizzes</u> starting on the first day of class!

PART 2: Assignments from Chapter P

The first chapter of the textbook is chapter P (Preparation for Calculus) and covers concepts learned in previous math courses. The three assignments below are due on the first day of class. Work can be completed on paper or electronically via Notability. A graphing calculator is required for some of the exercises. A virtual folder will be shared on the first day of class for those that prefer to work in Notability. Please **show all necessary support work**.

Assignment	**Read:**	**Assigned Exercises:**
1	pg 2-7	8/7-35odd,57-61odd
2	pg 10-15	16/1-21odd,25,31,37-45odd, 53,55,59,67
3	pg 19-26	27/5-19odd,27,29,31,33,39,41, 47,49,51-57,59,61,63,67

Blessings on your summer!

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Memorization List for AP Calculus AB/BC

- $\csc\theta = \dfrac{1}{\sin\theta}$
- $\sec\theta = \dfrac{1}{\cos\theta}$
- $\cot\theta = \dfrac{1}{\tan\theta} = \dfrac{\cos\theta}{\sin\theta}$
- $\tan\theta = \dfrac{\sin\theta}{\cos\theta}$
- $\sin^2\theta + \cos^2\theta = 1$
- $1 + \tan^2\theta = \sec^2\theta$
- $1 + \cot^2\theta = \csc^2\theta$
- $\sin(\alpha \pm \beta) = \sin\alpha\cos\beta \pm \cos\alpha\sin\beta$
- $\cos(\alpha \pm \beta) = \cos\alpha\cos\beta \mp \sin\alpha\sin\beta$
- $\tan(\alpha \pm \beta) = \dfrac{\tan\alpha \pm \tan\beta}{1 \mp \tan\alpha\tan\beta}$
- $\sin 2\theta = 2\sin\theta\cos\theta$
- $\cos 2\theta = \cos^2\theta - \sin^2\theta = 1 - 2\sin^2\theta = 2\cos^2\theta - 1$
- $\tan 2\theta = \dfrac{2\tan\theta}{1 - \tan^2\theta}$
- $\sin\dfrac{\theta}{2} = \pm\sqrt{\dfrac{1 - \cos\theta}{2}}$
- $\cos\dfrac{\theta}{2} = \pm\sqrt{\dfrac{1 + \cos\theta}{2}}$
- $\tan\dfrac{\theta}{2} = \dfrac{1 - \cos\theta}{\sin\theta} = \dfrac{\sin\theta}{1 + \cos\theta}$
- $\sin\theta = \dfrac{opp}{hyp}$
- $\cos\theta = \dfrac{adj}{hyp}$
- $\tan\theta = \dfrac{opp}{adj}$
- $\sin\dfrac{\pi}{3} = \dfrac{\sqrt{3}}{2}, \cos\dfrac{\pi}{3} = \dfrac{1}{2}, \tan\dfrac{\pi}{3} = \sqrt{3}$

- $\sin\frac{\pi}{6}=\frac{1}{2},\cos\frac{\pi}{6}=\frac{\sqrt{3}}{2},\tan\frac{\pi}{6}=\frac{\sqrt{3}}{3}$
- $\sin\frac{\pi}{4}=\frac{\sqrt{2}}{2},\cos\frac{\pi}{4}=\frac{\sqrt{2}}{2},\tan\frac{\pi}{4}=1$
- $\sin\frac{\pi}{2}=1,\cos\frac{\pi}{2}=0,\tan\frac{\pi}{2}=undefined$
- $\sin\pi=0,\cos\pi=-1,\tan\pi=0$
- $\sin\frac{3\pi}{2}=-1,\cos\frac{3\pi}{2}=0,\tan\frac{3\pi}{2}=undefined$
- $\sin 2\pi=0,\cos 2\pi=1,\tan 2\pi=0$
- $a^2-b^2=(a+b)(a-b)$
- $a^3-b^3=(a-b)(a^2+ab+b^2)$
- $a^3+b^3=(a+b)(a^2-ab+b^2)$
- $a^2+2ab+b^2=(a+b)^2$
- $a^2-2ab+b^2=(a-b)^2$
- Quadratic Formula: $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$
- Slope between 2 points: $m=\frac{y_2-y_1}{x_2-x_1}$
- Perpendicular lines: have slopes that are opposite and reciprocal
- Pascal's Triangle: coefficients of $(a\pm b)^n$
- Definition of a Function-a relation in which for each x-value there is only one y-value.
- Domain- the set of all x-values (input)
- Range- the set of all y-values (output)
- Pythagorean Theorem: $a^2+b^2=c^2$
- Area of a Triangle: $A=\frac{1}{2}bh$
- Area/Perimeter of a Rectangle: $\begin{matrix}A=lw\\P=2l+2w\end{matrix}$
- Area of a Trapezoid: $A=\frac{1}{2}h(b_1+b_2)$
- Area/Circumference of a Circle: $\begin{matrix}A=\pi r^2\\C=2\pi r\end{matrix}$
- Volume/Surface Area of a Rectangular box: $\begin{matrix}V=lwh\\S=2(hl+lw+hw)\end{matrix}$

- Volume/Surface Area of a Sphere: $V = \frac{4}{3}\pi r^3$
  $S = 4\pi r^2$
- Volume/Surface Area of a Right Circular Cylinder: $V = \pi r^2 h$
  $S = 2\pi rh$
- Volume/Surface Area of a Right Circular Cone: $V = \frac{1}{3}\pi r^2 h$
  $S = \pi r\sqrt{r^2 + h^2}$
- Equation of a Circle: $(x-h)^2 + (y-k)^2 = r^2$
  center: (h,k), radius $= r$
- Equation of a Parabola:

$y = a(x-h)^2 + k$	$x = a(y-k)^2 + h$
$vertex\ (h,k)$	$vertex\ (h,k)$
$up:\ a > 0$	$right:\ a > 0$
$down:\ a < 0$	$left:\ a < 0$
$normal:\ \lvert a \rvert = 1$	$normal:\ \lvert a \rvert = 1$
$shrink:\ \lvert a \rvert < 1$	$shrink:\ \lvert a \rvert < 1$
$stretch:\ \lvert a \rvert > 1$	$stretch:\ \lvert a \rvert > 1$

- Equation of a Hyperbola:

$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$ (about the x-axis) or $\frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$ (about the y-axis)

- Equation of an Ellipse:

$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ (major axis horizontal) or $\frac{(y-k)^2}{a^2} + \frac{(x-h)^2}{b^2} = 1$ (major axis vertical)

- Equation of a Special Hyperbola: $xy = k$