ADVANCED PLACEMENT CALCULUS BC SUMMER WORK

You are currently enrolled in AP Calculus BC scheduled to begin in the fall. As you know, this is a college-level course and it will be rigorous and challenging. In preparation for the study of calculus, I have prepared a review packet of questions for you. You are to solve all of the questions in this packet and SHOW ALL WORK. There are a few problems that can be done in your head, but most of them will require that you work on paper. This is a good habit that you will need for calculus.

All of these questions deal with topics you learned in previous courses. You may have forgotten how to do some of them. Talk to your friends and maybe they can refresh your memory or use the internet as a resource. Sections from the PreCalculus book are listed beside the question for some if you want to consult your notes from that course. If you feel that you don't know how to do many of these problems, maybe AP Calculus BC is not the correct course for you at this time.

Please SAVE this assignment until the beginning of August –
it will serve as a better refresher than if you do it earlier in the summer.

It is expected that you hand in your solutions and work to these problems by the second day of class. Calculator is not needed on any of the problems. You will be assessed on these topics along with Chapter 1.

I am looking forward to working with all of you. Enjoy your summer break.

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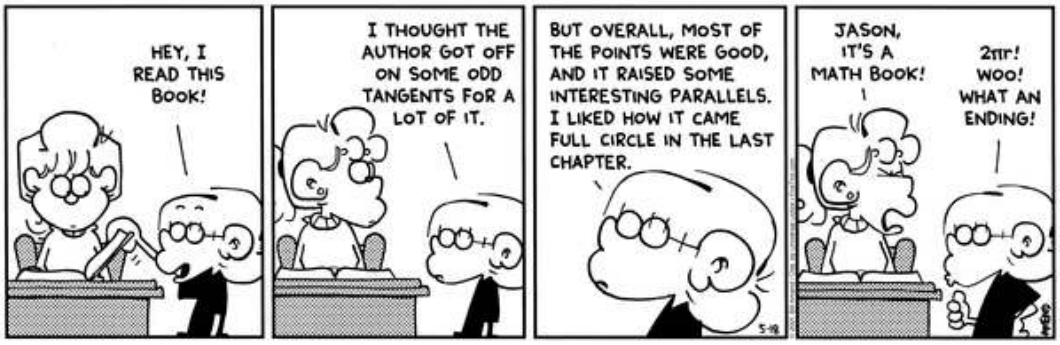
You may e-mail questions but please be patient for a response.

An **answer key** will be sent out about a week before school begins. If you do not receive it, please email me.

Have fun!!



1. Factor and simplify. Express the answer as a fraction without negative exponents.

$$x(x-1)^{-1/2}+2(x-1)^{1/2}$$

2. Express as a simple fraction. $\dfrac{\dfrac{1}{y-k}-\dfrac{1}{y}}{k}$

3. Expand. $\left(x^{3/2}+\dfrac{2}{\sqrt{3}}\right)^2$

4. Solve for x. $x^2-x=5$

5. Write an equation of the line passing through the point $(3,-1)$ with slope $\dfrac{5}{2}$.

6. Solve for y'. (y' is a variable like x or y.) $xy'+y=1+y'$

7. Write the equation of the circle in standard form and give the center and radius.
$2x^2+2y^2+4x-12y+11=0$

8. Solve for x.

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

9. Find the domain of f. $f(x)=\sqrt{2x+3}$

Solve each of the following. Show algebraic work.

10. $\dfrac{e^{x+5}}{e^5} = 3$

11. $\left(e^3\right)^{2x} = e^3 e^{2x}$

12. $3^{2x} - 2 \cdot 3^{(x+5)} + 3^{10} = 0$

13. $\ln x - \ln(x+1) = 1$

Sketch. Include all asymptotes and intercepts, and give domains.

14. $f(x) = e^x$

15. $f(x) = \ln x + 2$

16. $f(x) = \ln(x+2)$

17. Use the properties of logarithms to expand $\ln \frac{(x+3)x}{y^3}$.

18. Fill in the following table with exact values (simplified radical form).
You are expected to know all trigonometric values on the unit circle at all times.

	Quadrant I					Quadrant II				Quadrant III				Quadrant IV		
Degrees	0	30	45	60	90	120	135	150	180	210	225	240	270	300	315	330
Radians																
$\sin\theta$																
$\cos\theta$																

19. If $\csc\theta = \dfrac{13}{5}$ and θ is in the second quadrant, find $\sec\theta$.

20. Simplify $\dfrac{\cot\theta}{\csc\theta}$.

Solve in the interval $[0, 2\pi)$

21. $\sin 2\theta = 0$

22. $2\cos\theta\tan\theta + \tan\theta = 0$

23. Write the expression $\sqrt{x^2+4}$ in terms of θ when $x = 2\tan\theta$.

24. Find $\sin 2A$ if $\sin A = \dfrac{1}{4}$ and $0 \le A \le \dfrac{\pi}{2}$.

25. If $\cos 2\theta = \dfrac{1}{3}$ and $0 \le 2\theta \le \pi$, find $\cos\theta$.

26. Rewrite the given equation using the substitutions $x = r\cos\theta$ and $y = r\sin\theta$. Simplify your answer and solve for r. $x^2 + y^2 + 3x = 0$

27. Write $\tan\left(\arccos\dfrac{x}{3}\right)$ in algebraic form.

28. Compute $\arcsin\left(-\dfrac{1}{2}\right)$.

29. Evaluate the following limits:

$g(x) = \frac{x^3+7x^2+6x}{x^2+8x+12}$

$\lim_{x\to 0} g(x) =$_____ $\lim_{x\to -1} g(x) =$_____ $\lim_{x\to -2^+} g(x) =$_____

$\lim_{x\to -2^-} g(x) =$_____ $\lim_{x\to \infty} g(x) =$_____ $\lim_{x\to -\infty} g(x) =$_____