BISHOP GEORGE AHR HIGH SCHOOL
ONE TINGLEY LANE • EDISON, NJ 08820

Mathematics Department

May 29, 2019

Are you ready for AP Calculus?
Summer Assignment

Attached is the summer assignment for students going into AP Calculus AB and AP Calculus BC.

When you print out the problems, you are to put all work and all answers on the sheets. Do the work in pencil, in a neat, organized manner using correct mathematical notation. If you need more space to work use loose leaf paper. Answer all questions.

Be prepared to hand in this assignment on the first full day of school, September 10, 2019.

If you have any questions or problems, please e-mail Ms. Stancik at astancik@bgahs.org by August 2. Ms. Stancik is not available after August 2.

ARE YOU READY FOR CALCULUS?

Summer Assignment

AP Calculus BC, AP Calculus AB

NAME:_____

1. **Factor** and **simplify**. Express the answer as a **fraction without negative exponents**. $x(x-1)^{\frac{-1}{2}}+2(x-1)^{\frac{1}{2}}$	2. Perform the addition and simplify: $\frac{2}{x^2-x-2}+\frac{10}{x^2+2x-8}$
3. Multiply. $\left(x^3+2\sqrt{3}\right)^2$	4. Solve for ***x***. $x^2-x=6$
5. Find the **smallest value of *x*** that satisfies the equation. $\lvert x+5\rvert=3$	6. Factor: $x^3+5x^2-5x-25$
7. Solve for ***x***. $x^2-x=5$ (round final answer to 3 decimal places)	8. Solve for ***x***. $\ln\left(e^{7x}\right)=15$
9. Solve for ***x***. $\frac{e^{x+5}}{e^5}=3$	10. Solve for ***x***. $\left(e^3\right)^{2x}=e^3e^{2x}$

11. Condense: $2\ln x - \ln\left(x^2+x-3\right)$	**12. Solve for *x*.** $e^{\left[2\ln x-\ln\left(x^2+x-3\right)\right]}=1$
13. Find the ***x*-intercept** for the graph of the function. $f(x)=\ln x+2$	14. Use the **properties of logarithms** to **expand** the expression. $\ln\dfrac{\left(4x^5-x-1\right)\sqrt{x-7}}{\left(x^2+1\right)^3}$
15. Solve for ***x***. $\ln x-\ln\left(x+1\right)=1$	16. If $\csc\theta=\dfrac{13}{5}$ and θ is in the **second** quadrant, find $\sec\theta$.
17. Find **all** θ in the interval $\left[0,2\pi\right)$ that satisfy the equation. $\sin 2\theta=0$	18. Simplify. $\dfrac{\cot\theta}{\csc\theta}$
19. Find **all** θ in the interval $\left[0,2\pi\right)$ that satisfy the equation. $2\cos\theta\tan\theta+\tan\theta=0$	20. Prove the identity. $\dfrac{\cos^2 x+\sin^2 x}{\sin x\cos x}=\sec x\csc x$

21. Simplify.

a) $\dfrac{x^3-9x}{x^2-7x+12}$

b) $\dfrac{x^2-2x-8}{x^3+x^2-2x}$

22. Rationalize the denominator.

a) $\dfrac{4}{1-\sqrt{5}}$

b) $\dfrac{2}{\sqrt{3}+\sqrt{2}}$

23. Solve for *x*. (do not use a calculator)

a) $5^{(x-2)}=\dfrac{1}{125}$

b) $5(2^{(2x-1)})=80$

24. Solve for *x*. (do not use a calculator)

a) $\log_2 x=3$

b) $2\log_3(x+1)=4$

25. Simplify.

a) $\log_3 3^{\frac{1}{2}}$

b) $2\log_4 9-\log_2 3$

26. Find the vertex and indicate the direction that the parabola opens. (do not use a calculator)

a) $-x=(y+3)^2-4$

b) $-3(y-5)^2-7=x+2$

27. Solve for ***x*** on the indicated interval.

a) $3\sin^2 x = \cos^2 x \;\; ; \;\; 0 \le x < 2\pi$

b) $\cos^2 x - \sin^2 x = \sin x \;\; ; \;\; -\pi \le x < \pi$

28. Without using a calculator, evaluate the following.

a) $\sin\dfrac{5\pi}{4}$

b) $\cos\dfrac{9\pi}{4}$

29. Solve for ***x***.

a) $4x^2 + 12x + 3 = 0$

b) $2x + 1 = \dfrac{5}{x+2}$

30. Find the **remainders** using long division.

a) Divide $4 - x^2$ by $x + 5$

b) Divide $7x^3 + 3$ by $x + 2$

31. Solve for ***x***.

a) $|-x + 4| \le 1$

b) $|5x - 2| = 8$

32. Write the equation for the line(s) described. (answer in form $Ax+By=C$)

a) the line through $(-1,3)$ and $(2,-4)$

b) the line through $(-1,2)$ and perpendicular to $2x-3y+5=0$

33. Find the point of intersection of the lines.

a) $x+y=4$ and $x-y=2$

b) $1.5x+0.8y=2.3$ and $0.3x-0.2y=0.1$

34. For the circle $(x+3)^2+(y-2)^2=10$, find:

a) the center point

b) the length of the radius and diameter

35. Find the **domain** of the function. (use interval notation)

a) $f(x)=7$

b) $f(x)=\dfrac{5x-3}{2x+1}$

36. Find the **range** of the function.

a) $f(x)=7$

b) $f(x)=2x+1$

37. Find and simplify $f(x+3)$ for each given $f(x)$

a) $f(x)=2x+3$

b) $f(x)=\dfrac{1}{x+1}$

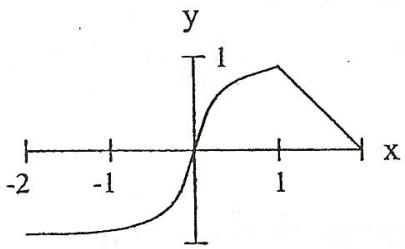
38. Write the **inverse** of the function.

a) $f(x)=2x+3$

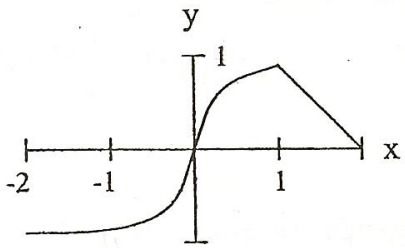
b) $f(x)=\dfrac{x+2}{5x-1}$

39. The graph of the function $y=f(x)$ is given below. On the same axes determine ***(sketch)*** the graphs of the following:

a) $f(x+1)$

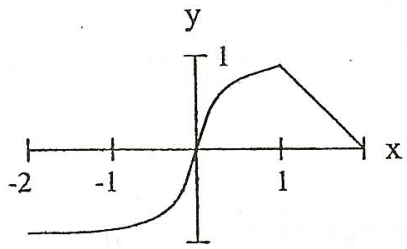


b) $f(-x)$

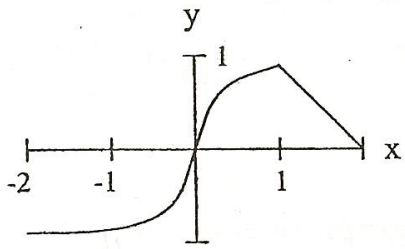


40. The graph of the function $y=f(x)$ is given below. On the same axes determine ***(sketch)*** the graphs of the following:

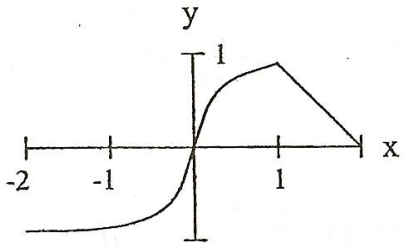
a) $f(x)+1$



b) $-f(x)$



c) $|f(x)|$



d) $f|x|$