

AP Calculus Summer Assignment

Do the following problems on another sheet of paper. They will be due when you take a test on it the 2nd day of school. (No calculator is allowed and show all work. There are more problems on the back of this page.)

Solve the following equations for x.

1. $5\ln(x-2) - 2 = 28$	2. $e^{x-3} + 4 = 20$	3. $\frac{3}{x-4} - \frac{2}{3x} = 0$
4. $\tan x - 3 = -4; 0 < x < \pi$	5. $\frac{1}{4}\sin^3 x \cos x = 0; 0 \leq x \leq \pi$	6. $x^2 - 3x = 5$

Simplify the following expressions.

7. $\frac{x^2 - 4x - 5}{x^2 - 25}$	8. $\frac{4}{x} - \frac{5x}{x-3} + x^3$	9. $\frac{\tan x \cos x}{\csc x}$	10. $8^{-4/3}$	11. $(\sqrt[6]{27})^4$
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Write the equation of a line given the following information.

12. (3,5) and (-2,25)	13. (3,5) and (3,-3)	14. $m = 1/3$ and (2,3)
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Sketch the two equations on the same coordinate plane, then label the points of intersection, and x & y-intercepts.

15. $y = x + 1$ and $y = 4 + 3x - x^2$
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Use the unit circle to find the values of problems 16-18.

16. $\sin \frac{3\pi}{2}$	17. $\cos \frac{11\pi}{6}$	18. $\tan \frac{\pi}{6}$
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19. $f(x) = x^2 - 2x$, $g(x) = 3x + 4$, $h(x) = f(g(x))$

a) What is the value of $h(3)$?

b) What is the $h(x) - g(x)$?

20. Sketch the following parent graphs.

a) $y = x$

b) $y = x^2$

c) $y = x^3$

d) $y = \sqrt{x}$

e) $y = |x|$

f) $y = \frac{1}{x}$

g) $y = e^x$

h) $y = \sin x$

i) $y = \cos x$

j) $y = \tan x$

Answers

1. $e^6 + 2$	2. $\ln(16) + 3$	3. $\frac{-8}{7}$	4. $\frac{3\pi}{4}$
5. $0, \frac{\pi}{2}, \pi$	6. $\frac{3 \pm \sqrt{29}}{2}$	7. $\frac{x+1}{x+5}$	8. $\frac{x^5 - 3x^4 - 5x^2 + 4x - 12}{x(x-3)}$
9. $\sin^2 x$	10. $\frac{1}{16}$	11. 9	12. $y = -4x + 17$
13. $x = 3$	14. $y = \frac{1}{3}x + \frac{7}{3}$	15. x-int (-1,0) & (4,0) y-int (0,1) & (0,4) intersection points (-1,0) & (3,4)	
16. -1	17. $\frac{\sqrt{3}}{2}$	18. $\frac{\sqrt{3}}{3}$	19. a) 143 b) $9x^2 + 15x + 4$

20. Use Desmos to check your answers.

AP Calculus Summer Assignment Page 2

Do the following problems on another sheet of paper. They will be due when you take a test on it the 2nd day of school. (No calculator is allowed and show all work)

Solve the following equations for x.

1a) $2 \log_3(x-2) - 4 = 0$ 1b) $\log(3-x)^2 + 1 = 3$	2a) $3(2)^{2x+1} - 4 = 8$ 2b) $5(e)^{x-6} + 2 = 27$	3a) $\frac{1}{x+2} - 2 = \frac{3}{x}$ 3b) $\frac{2}{x} - 1 = \frac{3x}{2x-1}$
4a) $\cot^2 x = 3; 0 < x < 2\pi$ 4b) $-8 \cos x = 4; 0 < x < \pi$	5a) $2 \sec x \cos^2 x = -\sqrt{3}; 0 \leq x \leq 2\pi$ 5b) $-3 \tan x \csc^2 x = 0; 0 \leq x \leq \pi$	6a) $2x - x^2 = x - 3$ 6b) $x - 2x^2 = 4x - 4$

Simplify the following expressions.

7a) $\frac{6x^2 + 17x + 5}{25 - 4x^2}$ 7b) $\frac{3x^2 - 6x}{4 - x^2}$	8a) $\frac{x}{x+1} - \frac{1}{x-2} + 2$ 8b) $\frac{2}{3} - \frac{x}{x+2} + \frac{1}{3x+6}$	9a) $\frac{\cot x \sin x}{\sec^2 x}$ 9b) $\frac{\cos x \sin^2 x}{\tan^2 x}$	10a) $81^{-3/2}$ 10b) $100^{5/2}$	11a) $(\sqrt[4]{16})^3$ 11b) $(\sqrt[3]{-8})^{-2}$
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Write the equation of a line given the following information.

12a) (-3,4) and (2,-6) 12b) (1,5) and (-2,-4)	13a) (2,-3) and (4,-3) 13b) (-2,5) and (-4,5)	14a) $m = -3/4$ and (8,-6) 14b) $m = 3$ and (1,-4)
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Sketch the two equations on the same coordinate plane, then label the points of intersection, and x & y-intercepts.

15a) $y = 2x + 1$ and $y = 9 - x^2$	15b) $y = 5x + 1$ and $y = x^2 + 4x - 5$
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Use the unit circle to find the values of problems 16-18.

16a) $\sec\left(-\frac{3\pi}{4}\right)$	16b) $\cot(\pi)$	17a) $\csc\left(\frac{\pi}{4}\right)$	17b) $\cos\left(-\frac{2\pi}{3}\right)$	18a) $\cot\left(\frac{2\pi}{3}\right)$	18b) $\tan\left(\frac{5\pi}{6}\right)$
19. $f(x) = x^2 - 3x$, $g(x) = 5 - x$, $h(x) = f(g(x))$					
a) What is the value of $h(-2)$ and $2f(-1) - 5$?			b) What is $h(x) - f(x)$ and $3g(x) - h(x) + 2$?		

Links to worked out solutions and an online textbook are on this website: <http://www.wowmath.org>

The following problems are not homework, but might help you be more prepared for the course, as well as do better on the actual summer assignment.

p.8(1-11,19-23,61-67), p.16(1-17,23-39,49-55,59), p.27(3-7,13-17,25-27)

To do these problems you must check out a Calculus textbook from the library or go to the online textbook link at <http://www.wowmath.org>. Worked out solutions to the problems are on the online textbook. You can also check out a solutions manual from the library.