

AP Calculus Summer Review Material
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These problems may seem simple, possibly even too easy for an AP Calculus prep. However, they make you exercise core algebra and trig skills that so many students struggle with during the course. You will come to know all too well that the easiest thing about AP Calculus, is the Calculus... The complete, organized solutions to these problems are due the first day of class in August and will be graded to count as the first homework assignment of the year. Welcome to your first college math course.

For 1 – 3, find $f(-1)$, $f(3)$, and $f(x+h)$. ' $x+h$ ' is just a number, and you should treat it like so with basic order of operations

1) $f(x) = 5x - 3$

2) $f(x) = -2x^2 - 3x + 5$

3) $f(x) = \frac{x-1}{x+2}$

4) Show step by step how $e^{kt+c} = ce^{kt}$, where c is a constant.

For 5 – 6, completely simplify and reduce the following expression with no rational or negative exponents :

5) $\frac{1}{2}(x^2 - 3x - 1)^{-\frac{1}{2}}(2x - 3)$

6) $\frac{4}{3}(2x - 1)^{\frac{2}{3}}(2)$

For 7 – 12, give an ACCURATE graph of the function, providing at least 3 points of reference, and state the domain in formal set notation

7) $f(x) = \sqrt[3]{x} - 1$

8) $g(x) = 2\cos x + 1$

9) $y = \ln \ln (x - 1)$

10) $y = 2e^x$

11) $f(x) = \{x - 1, \quad x < -2 \quad x^2, \quad -2 \leq x < 2 \quad \sqrt{x}, \quad x \geq 2$

12) $h(x) = \frac{|x|}{x}$

13) *Completely simplify the expression with no negative exponents :*

$$(x^2 - 3x) \left(\frac{1}{2}(2x - 3)^{-\frac{1}{2}}(2) \right) + \sqrt{2x - 3}(2x - 3)$$

For 14 – 17, completely simplify or solve the trig expression or equation :

14) $\sin \sin - \frac{5\pi}{6}$

15) $\sec \frac{\pi}{2}$

16) $\tan \frac{5\pi}{4}$

17) $x - 1 = 0$

For 18 – 20, prove or provide the trig identity

18) $\sin \sin 2x =$

19) $\cos \cos 2x =$

20) $-\frac{1-x}{1+x}$