

WELCOME

ADVANCED PLACEMENT CALCULUS AB/BC

2009 - 2010 SCHOOL YEAR

The Advanced Placement Calculus class you are enrolled in will begin on Monday August 24, 2009. As you know, this is a college 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. If you feel that you don't know how to do many of these problems, maybe AP Calculus is not the correct course for you at this time.

It is expected that you hand in your solutions and work to these problems on the first day of class. This assignment is worth 50 points. Do not wait until the last minute to do this lengthy assignment. You will be tested on these topics within the first week of class.

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

Mrs. Leonard
RHS Mathematics Department

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

Visit my website at: http://204.193.113.204/leonard_a/ClassAnnouncements.aspx
An answer key will be posted but you will still need to show work.

Gateway - Algebra

Please answer each of the following. Show all of your work.

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.

$$\frac{\frac{1}{y-k} - \frac{1}{y}}{k}$$

3. Multiply.

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

4. Solve for x.

$$x^2 - x = 5$$

5. Find the smallest value of x that satisfies the equation.

$$|x+5|=3$$

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

7. Solve for y' .

$$xy' + y = 1 + y'$$

8. Write the equation of the circle in standard form and give the center and radius.

$$2x^2 + 2y^2 + 4x - 12y + 11 = 0$$

9. Solve for x .

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

10. Find the domain of f .

$$f(x) = \sqrt{2x+3}$$

Gateway - Exponential and Log Functions

Please answer each of the following. Show all of your work.

1. Solve for x.

$$\ln(e^{7x}) = 15$$

2. Solve for x.

$$\frac{e^{x+5}}{e^5} = 3$$

3. Solve for x.

$$(e^3)^{2x} = e^3 e^{2x}$$

4. Solve for x.

$$e^{\left[2\ln x - \ln(x^2 + x - 3)\right]} = 1$$

5. Solve for x.

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

6. Sketch the graph of the function.

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

7. Find the x-intercept for the graph of the function.

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

8. Use the properties of logarithms to expand the expression.

$$\ln \frac{(4x^5 - x - 1)\sqrt{x-7}}{(x^2 + 1)^3}$$

9. Solve for x.

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

10. Find the domain of the function.

$$f(x) = \ln(3x + 2)$$

Gateway - Trigonometry

Please answer each of the following. Show all of your work.

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

2. Find all θ in the interval $[0, 2\pi)$ that satisfy the equation.

$$\sin 2\theta = 0$$

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

4. Simplify $\frac{\cot \theta}{\csc \theta}$.

5. Find $\sin 2A$ if $\sin A = \frac{1}{4}$ and $0 \leq A \leq \frac{\pi}{2}$.

6. Find all θ in the interval $[0, 2\pi)$ that satisfy the equation.

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

7. If $\cos 2\theta = \frac{1}{3}$ and $0 \leq 2\theta \leq \pi$, find $\cos \theta$.

8. Rewrite the given equation using the substitutions $x = r \cos \theta$ and $y = r \sin \theta$. Simplify your answer.

$$x^2 + y^2 + 3x = 0$$

9. Write the given expression in algebraic form.

$$\tan\left(\arccos \frac{x}{3}\right)$$

10. Compute $\arcsin\left(-\frac{1}{2}\right)$.