

Written Work will be collected the first day of school, **August 12, 2013.**

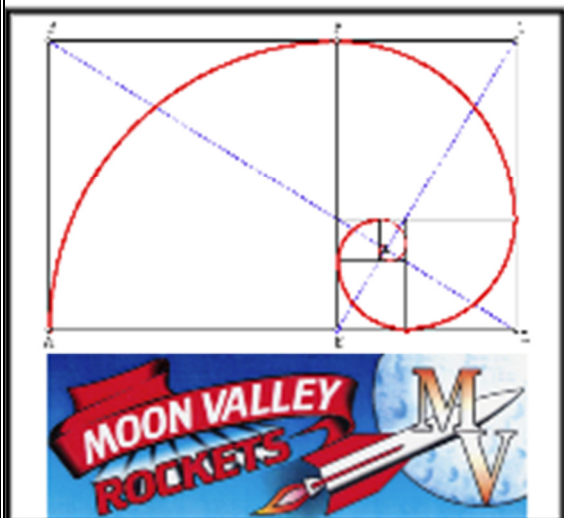
Electronic work should be completed **BEFORE August 12, 2013.**

Name: _____

Period: _____ Date: _____

Class of : _____

AP Calculus 2013-2014 Summer Assignment Mrs. Thomas



Moon Valley Website:

<http://moonvalley.guhsdaz.org/cms/One.aspx>

Mrs. Thomas's AP Calculus Website:

<https://sites.google.com/a/guhsdaz.org/kthomas/home>

Student Login to Google is Student

ID#@student.guhsdaz.org *You must know your password.*

Contact Mrs. Thomas using e-mail:

Kim.Thomas@guhsdaz.org

Formula Sheet

Arc Length: $s = r\theta$

Area of a Sector: $A = \frac{1}{2}r^2\theta$

$$r = \sqrt{x^2 + y^2}$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sin \theta = \frac{y}{r} \quad \cos \theta = \frac{x}{r} \quad \tan \theta = \frac{y}{x}$$

$$\csc \theta = \frac{r}{y} \quad \sec \theta = \frac{r}{x} \quad \cot \theta = \frac{x}{y}$$

Sequences and Series

$$a_n = a_1 + (n-1)d \quad s_n = \frac{n}{2}(a_1 + a_n)$$

$$a_n = a_1r^{n-1} \quad s_n = \frac{a_1(1-r^n)}{1-r} \quad s_\infty = \frac{a_1}{1-r}$$

$$\log_a x = y \Leftrightarrow x = a^y$$

$$\log_b M = \frac{\log_a M}{\log_a b}$$

Growth, Decay, & Compound Interest

$$P(t) = P_0e^{kt} \quad P(t) = P_0e^{-kt}$$

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

Conic Sections

$$(x-h)^2 = 4p(y-k) \quad (x-h)^2 + (y-k)^2 = r^2$$

$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1 \quad \frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$

Law of Sines

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Permutation & Combination

$${}_n P_k = \frac{n!}{(n-k)!}$$

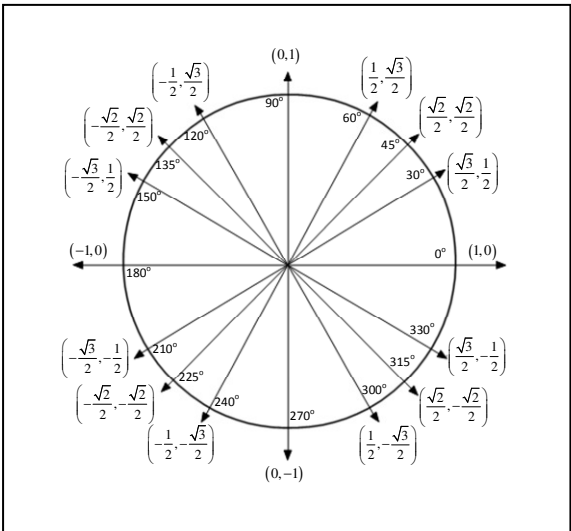
$${}_n C_k = \frac{n!}{k!(n-k)!}$$

Law of Cosines

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$b^2 = a^2 + c^2 - 2ac \cos B$$

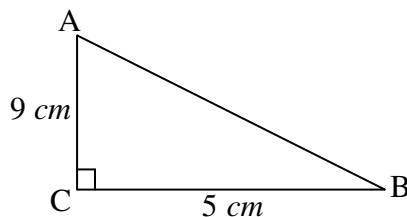
$$c^2 = a^2 + b^2 - 2ab \cos C$$



Complete each problem by selecting the best answer. Use your Honors Pre-Calculus end of year review as a reference. If you get stuck, call a friend or e-mail Mrs. Thomas. Show ALL work on this document.

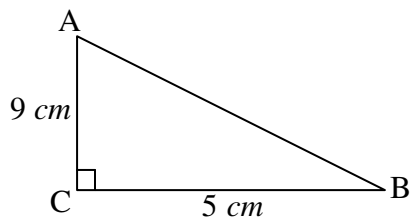
1. Use the diagram on the right to find $\tan A$:

- a. $\frac{5}{9}$
- b. $\frac{5}{\sqrt{106}}$
- c. $\frac{9}{\sqrt{106}}$
- d. $\frac{9}{5}$



2. Use the diagram on the right to find $\cos B$:

- a. $\frac{5}{\sqrt{56}}$
- b. $\frac{9\sqrt{106}}{106}$
- c. $\frac{5\sqrt{106}}{106}$
- d. $\frac{9}{5}$



3. Which of the following is equal to $\csc \theta$?

- a. $\frac{1}{\sin \theta}$
- b. $\frac{1}{\cos \theta}$
- c. $\frac{1}{\tan \theta}$
- d. $\frac{1}{\sec \theta}$

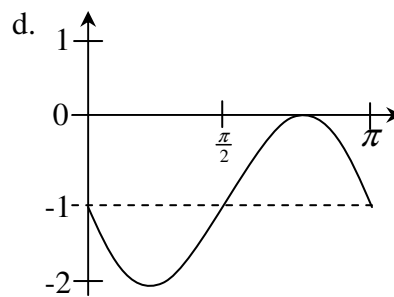
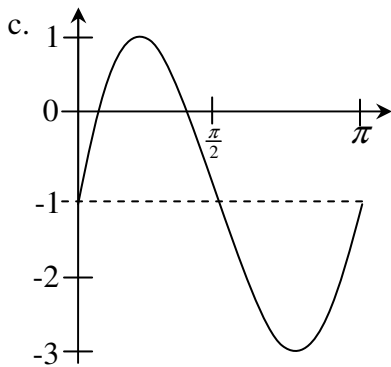
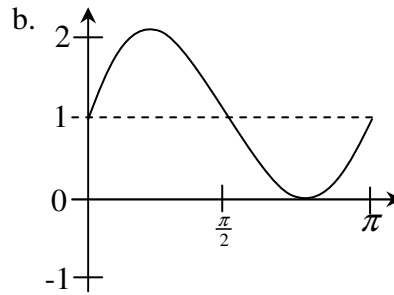
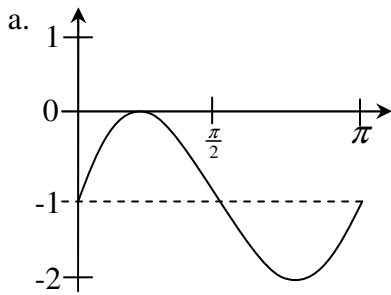
4. Find the exact value of $\sec 300^\circ$.

- a. $\frac{2}{3}$
- b. $-\frac{\sqrt{3}}{2}$
- c. $-\frac{2\sqrt{3}}{3}$
- d. $-\frac{\sqrt{3}}{3}$

5. Find the reference angle for an angle measuring 145° .

- a. 35°
- b. 225°
- c. 135°
- d. 55°

6. Graph the following equation, $y = -1 + \sin 2x$, over a one-period interval.



7. Change 125° to radian measure.

- a. $\frac{5\pi}{6}$
- b. $\frac{25\pi}{36}$
- c. $\frac{6\pi}{7}$
- d. $\frac{25\pi}{72}$

8. Change $\frac{25\pi}{18}$ radians to degree measure.

- a. 125°
- b. 60°
- c. 250°
- d. 130°

9. Given that $f(x) = 2x^2 + x - 5$, find $f(-3)$.

- a. -26
- b. -20
- c. 16
- d. 10

10. For $f(x) = x + 5$ and $g(x) = 3x + 1$, find the domain of $\frac{f}{g}$.

- a. $(-\infty, \infty)$
- b. $\left(-\infty, -\frac{1}{3}\right) \cup \left(-\frac{1}{3}, \infty\right)$
- c. $(-\infty, 5) \cup (5, \infty)$
- d. $\left(-\infty, -\frac{1}{3}\right) \cup \left(-\frac{1}{3}, 5\right) \cup (5, \infty)$

11. Find the domain for $f(x) = \sqrt{2x + 5}$

- a. $\left(-\infty, -\frac{5}{2}\right) \cup \left(-\frac{5}{2}, \infty\right)$
- b. $\left(-\infty, \frac{5}{2}\right) \cup \left(\frac{5}{2}, \infty\right)$
- c. $\left(-\infty, -\frac{5}{2}\right]$
- d. $\left[-\frac{5}{2}, \infty\right)$

12. For $f(x) = 2x - 5$ and $g(x) = x^2 - 6$, find $(f \circ g)(x)$.

- a. $4x^2 - 20x + 19$
- b. $2x^2 - 11$
- c. $2x^2 - 17$
- d. $2x - 11$

13. Find the vertical asymptote: $f(x) = \frac{4-x}{2+x}$

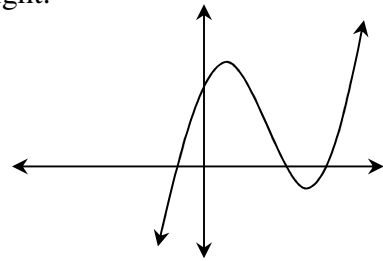
- a. $x = 2$
- b. $x = -2$
- c. $x = -1$
- d. $x = 4$

14. The graph of the equation $\frac{x^2 + 3x - 10}{x - 2}$ is a line with a hole in it. The hole occurs at which point?

- a. $(2, -10)$
- b. $(2, 5)$
- c. $(2, 7)$
- d. $(-5, 2)$

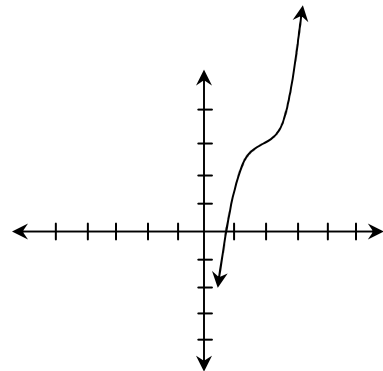
15. Identify the possible formula for the graph shown on the right.

- a. $y = (t+1)(t-4)(t-3)$
- b. $y = (t-1)(t-4)(t+3)$
- c. $y = (t+1)(t+4)(t+3)$
- d. $y = -(t+1)(t+4)(t-3)$



16. Which formula best matches the graph shown on the right.

- a. $y = (x^2 - 3) + 2$
- b. $y = (x - 2)^3 + 3$
- c. $y = (x^3 + 3) - 2$
- d. $y = (x - 3)^3 + 2$



17. For the function $f(x) = -8 + 4x + 3x^2 - x^3$, find the leading coefficient.

- a. 4
- b. -8
- c. 1
- d. -1

18. Find the roots of the following equation. Give the values in exact form.

$$x^3 - 25x^2 + 24x = 0$$

- a. 0, -1, -24
- b. 0, 1, 24
- c. 1, -1, 4, -6
- d. 1, -1, $\frac{-1 \pm \sqrt{97}}{2}$

19. Find the vertex for the following equation.

$$x^2 - 8x - y + 18 = 0$$

- a. (2, 4)
- b. (-4, -2)
- c. (4, 2)
- d. (-2, -4)

20. Find a formula for the inverse of $f(x) = 4x + 3$.

- a. $f^{-1}(x) = -4x - 3$
- b. $f^{-1}(x) = 3x + 4$
- c. $f^{-1}(x) = \frac{x}{4} - 3$
- d. $f^{-1}(x) = \frac{x - 3}{4}$

21. Suppose \$8000 is invested at a 4% interest rate, compounded monthly. How much will the investment be worth after 9 years?

- a. \$11,460
- b. \$74,933
- c. \$276,094
- d. \$2.5 E17

22. Evaluate the logarithm: $\log_2\left(\frac{1}{8}\right)$

- a. -1
- b. -3
- c. 3
- d. $\frac{1}{3}$

23. Simplify using the rules of logarithms: $\log_2 25 + \log_2 3$

- a. $\log_4 28$
- b. $\log_2 \left(\frac{25}{3} \right)$
- c. $\log_2 75$
- d. $\log_2 28$

24. Expand the following as sums and/or differences of simpler logarithmic expressions.

$$\ln \frac{3x\sqrt{x}}{(2x+1)^2}$$

- a. $\ln 3x + \frac{1}{2} \ln x - 2 \ln(2x+1)$
- b. $2 \ln(2x+1) - \ln 3x + \frac{1}{2} \ln x$
- c. $3 \ln x + \ln \sqrt{x} - 2 \ln(2x+1)$
- d. $\ln 3x + 2 \ln x - \frac{1}{2} \ln(2x+1)$

25. Convert to an exponential equation: $\log x = 15$.

- a. $x = e^{15}$
- b. $x = 10^{15}$
- c. $x = 15^{10}$
- d. $x^{15} = 10$

26. Solve: $4^x = 2^{3x-5}$.

- a. $\frac{5}{2}$
- b. 5
- c. -5
- d. $\frac{1}{5}$

27. Solve for x : $\log_3(3x-15) = 3$

- a. 14
- b. 8
- c. 6
- d. No Solution

28. The population of a bacteria culture doubled in 8 hr.
What was the exponential growth rate?

- a. 3.8%
- b. 4.2%
- c. 5.5%
- d. 8.7%

29. Find the indicated term of the geometric
sequence 100, 80, 64, ... , a_6

- a. $\frac{16,384}{625}$
- b. $\frac{1024}{25}$
- c. $\frac{4096}{125}$
- d. $\frac{8192}{25}$

30. Find the sum of the first 36 terms in the arithmetic series:
 $-0.2 + 0.3 + 0.8 + \dots$

- a. 318.6
- b. 332.2
- c. 307.8
- d. 314

Now that you have completed the written work, I want to make sure that you can find, access, and use the AP Calculus Website.

Go to Mrs. Thomas AP Calculus Website. Find the Summer Assignment Tab and complete the following TWO tasks:

- Enter your answers from the summer assignment into the Google Form.
 - Complete the “About Me” Form
-

These forms will be made available to you **July 15, 2013**. I want you to complete this summer assignment closer to the beginning of the school year, not at the end of this school year. *(By the way, I don't want you to complete the assignment the day before school starts. As AP Calculus students, you do need to manage your time.)* The assignment is intended as a refresher of what you already know.

You will need to know how to log into your student Google account in order to complete the electronic versions of the assignments. **Please make sure that you can access Google Docs and your Google Account before this school year ends.** Visit the media center or Mrs. Thomas in room 1508 for help.

If you are considering paying for Dual Enrollment, AP Calculus AB is Mat 220 at GCC and is 5 credit hours. If you have not already taken the placement test, you should do so over the summer. It will save you some time at the beginning of the school year, plus everything is fresh in your mind now. Information about Dual Enrollment can be found at: <http://www.gccaz.edu/dualenrollment/6298.htm>
GCC will be updating information throughout the summer.