

Dear Student,

Welcome to the Calculus program at Severna Park High School!

This packet has been designed to help refresh some of the mathematical skills that you will need next year. You are encouraged to work with other students or use reference texts; however, you will be individually responsible for mastering the material.

Please complete the packet in pencil. You may complete all work on this packet but your work must be neat and readable – circle all final answers.

Each student needs a TI-89 or TI-89 Titanium graphing calculator to complete the Calculus course. The calculator worksheets do not require much written work, but please show the complete answer as asked for and please practice with the TI-89 as it will become your best friend.

Please complete the trig review **without** a calculator.

Bring the work with you on the first day of school.

This review has been pared down considerably. Take this opportunity seriously and get ready for a great year of math!!! We look forward to working with you next year.

Sincerely,

Mr. Young

Ms. Jones

Mrs. Staisloff

Mr. Schwartz

- 1) Evaluate each expression. Use the editing features to obtain the second expression from the first. Use your calculator.

1) a) $2.84 - (-1.56 + 4.24)$ b) $\frac{2.84}{-1.56 + 4.24}$

2) a) $\frac{-1.9 + 5.2}{7.1 - 2.7}$ b) $\frac{-19 + 52}{71 - 27}$

3) a) $|35^{3.1} - 25^{2.3}|$ b) $\sqrt{35^{3.1} - 25^{2.3}}$

- 2) Evaluate the given expression. Use your calculator.

a) $\sin \frac{\pi}{6}$ b) $\tan \frac{7\pi}{6}$

- 3) Enter the following sequences and record the results. Use your calculator.

a) $2 \square \wedge \square 2 \square \wedge \square 3 \square \text{enter}$ b) $12 \square \div \square 3 \square (\square 4 \square) \square \text{enter}$

How has each result been calculated?

- 4) Use the TI-89 to simplify $\frac{4}{a-4} + \frac{a}{4-a}$ Hint: clear all single-letter variables by using

$\square F6 \square$ 1:Clear a-z... or $\square F6 \square$ 2:NewProb. Use your calculator.

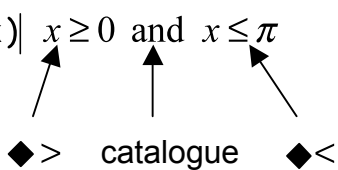
5) Find all roots of the following using the solve command. Use your calculator.

a) $7 - 5x < 2x$ b) $|x - 1| = |x| - 1$ c) $ax^2 + bx + c = 0$

6) Use the solve command to approximate all real roots of each equation to 3 decimal places. Use your calculator.

a) $x^2 + 2x + \sqrt{2} = 0$ b) $x^2 - 1 - \arctan x = 0$

c) $\sin 2x = \cos x$ from $0 \leq x \leq \pi$

Hint for part c: $\text{solve}(\sin(2x) = \cos(x), x) | x \geq 0$ and $x \leq \pi$


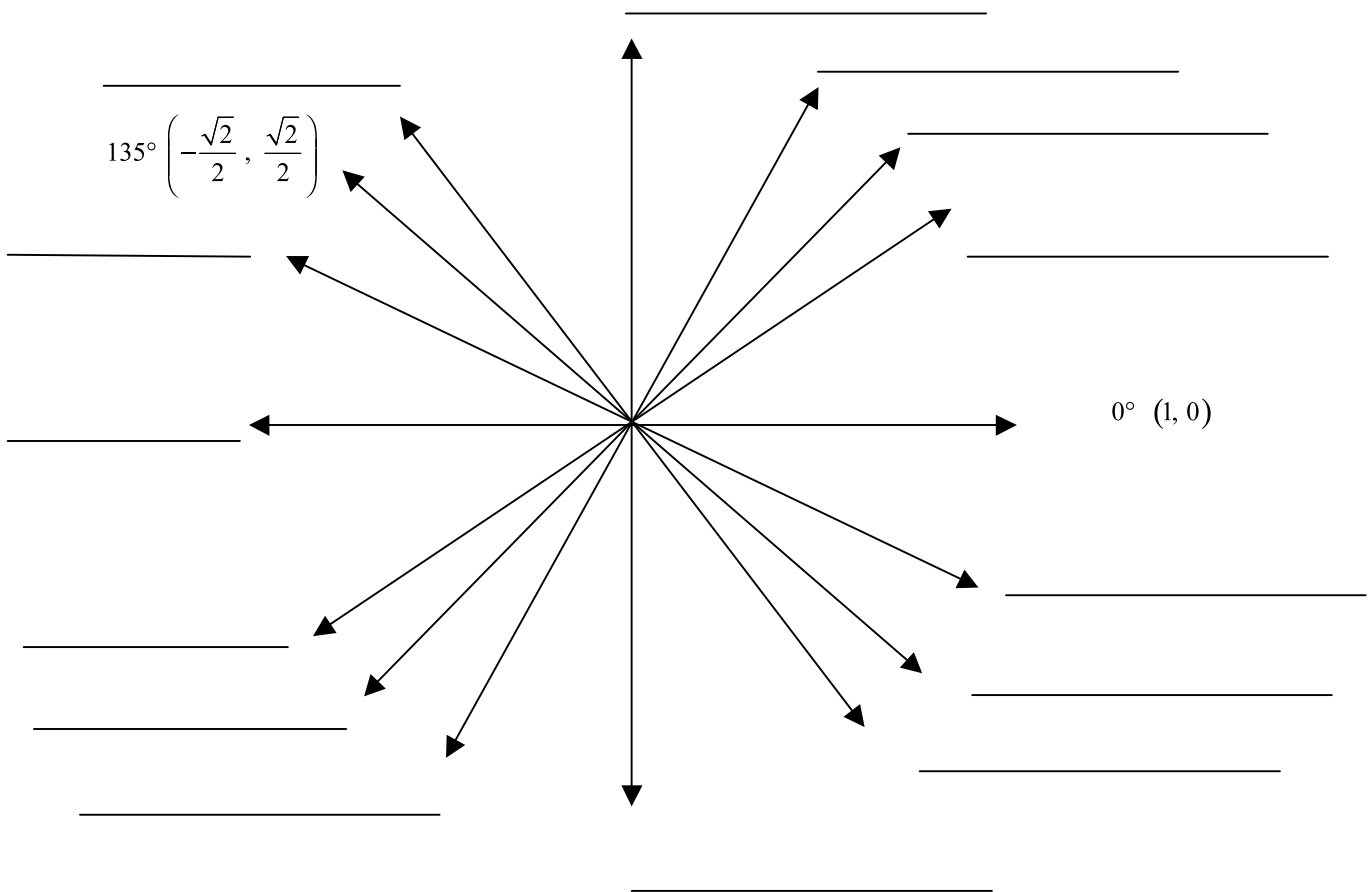
7) Sketch a graph of $f(x) = x \sin 2x - 2x + 7$ and use the $\boxed{F5}$: Math menu option 2: Zero to find all of the zeros of f . Use your calculator.

8) Sketch a graph of $f(x) = 2x^6 - 3x^5 - 3x^4 + 2x^3$ and use the $\boxed{F5}$ Math menu option 3: Minimum to find the minimum value on its domain. Use your calculator.

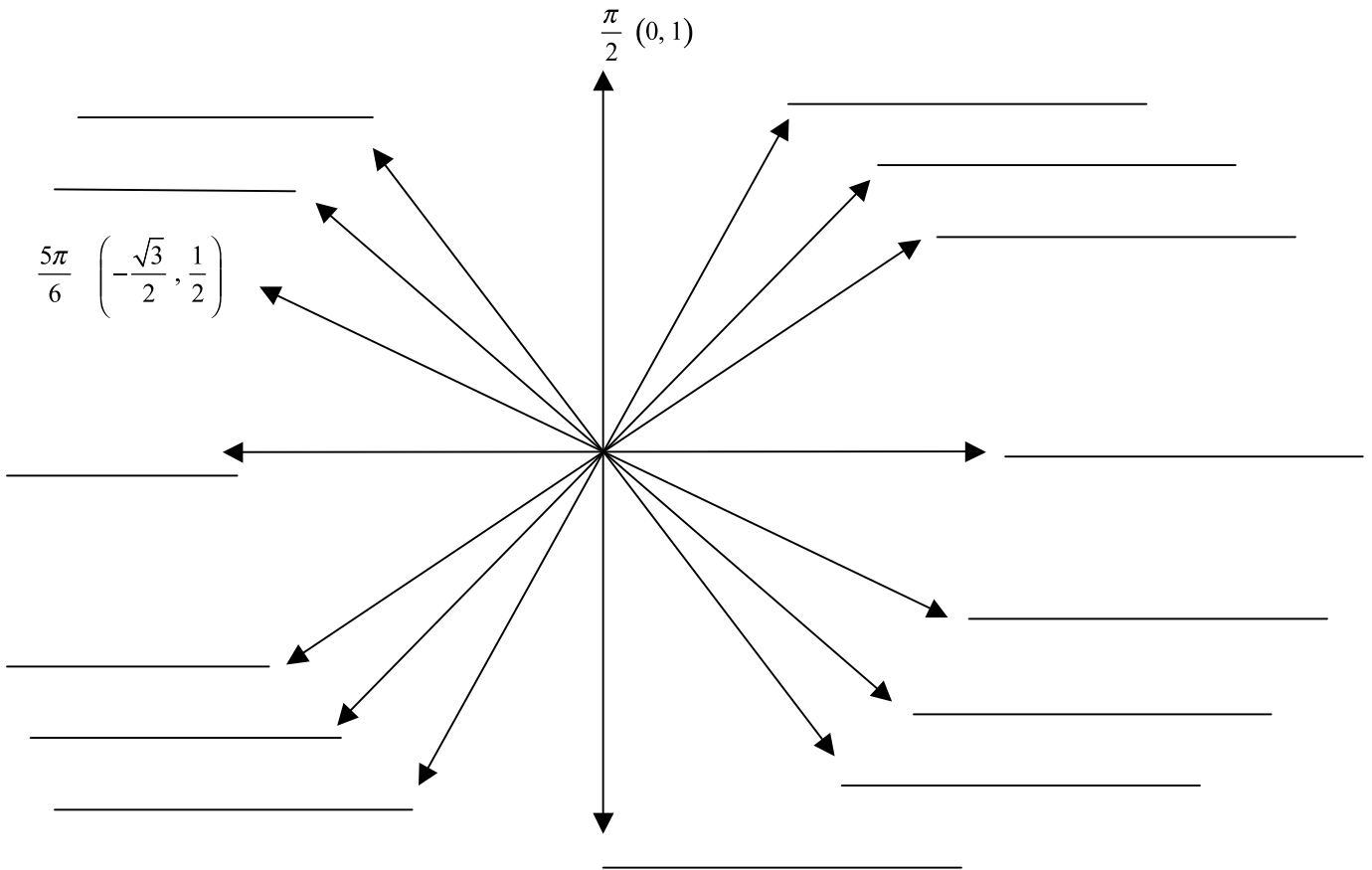
9) Plot graphs of $f(x) = 2 \cos x$ and $g(x) = x^3 - 2x$ and use the 5:intersection command on the Math menu to find point(s) of intersection of the graphs of f and g . Use your calculator.

Note: So many times in Calculus we find students who set up and work very difficult problems but fail to get the answer right because they could not do the last trig step. Please take your time in this section, and get them all right!. No calculators for numbers 10 – 16.

10) Label each angle in degrees and write its corresponding ordered pair. No calculators.



11) Label each angle in radians and write its corresponding ordered pair. No calculators.



12) Given: $1^\circ = \frac{\pi}{180^\circ}$ radians and $1 \text{ radian} = \frac{180^\circ}{\pi}$. No calculators.

a) express 146° in radians.

b) express 3 radians in degrees.

13) Evaluate the trigonometric functions at $\theta = \frac{5\pi}{6}$

a) $\sin \theta =$

b) $\cos \theta =$

c) $\tan \theta =$

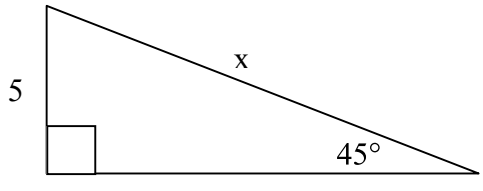
d) $\csc \theta =$

e) $\sec \theta =$

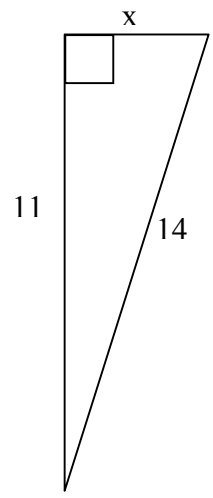
f) $\cot \theta =$

14) Find the missing part of each triangle. No calculators.

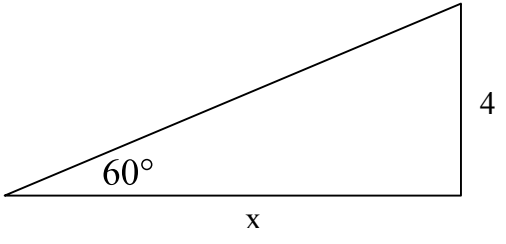
a)



b)



c)



16) Solve for θ where $0 \leq \theta < 2\pi$ No calculators.

a) $\tan \theta = -1$

b) $\cos \theta = 1$

c) $\sin \theta = \frac{1}{2}$

d) $\sin \theta = \frac{\sqrt{2}}{2}$

e) $\sin \theta = -\frac{\sqrt{2}}{2}$

f) $\tan \theta = -\frac{1}{\sqrt{3}}$

g) $\cos \theta = \frac{\sqrt{3}}{2}$

h) $\sin \theta = \frac{\sqrt{3}}{2}$

i) $\cos \theta = -\frac{1}{2}$

j) $\sin \theta = 0$

k) $\cos \theta = 0$

l) $\sin \theta = 1$

m) $\tan \theta = \text{undefined}$

n) $\cos \theta = 1$

17) Find all the solutions for the following equations on the interval $[0, 2\pi)$ algebraically.

a. $\tan x + \sqrt{3} = 0$

b. $2\sin^2 x = 2 + \cos x$

c. $2\cos 2x + \cos x - 1 = 0$

18) Evaluate the following

a. $\arccos \frac{\sqrt{2}}{2} =$

b. $\tan^{-1} \sqrt{3} =$

c. $\sin^{-1} \left(\frac{\sqrt{3}}{2} \right) =$

d. $\arctan 0 =$

19) Determine an appropriate window for each graph. Write down your min and maxs from your window. You may use a calculator.

a) $y = -x^3 + 8x^2 - x + 5$

y) $f(x) = \frac{3x^2 + x - 5}{x^2 + 1}$

20) Graph $f(x) = \frac{x^2 - 9}{x - 3}$. Explain why this graph is a linear function instead of a rational function having vertical asymptote at $x = 3$.

21) Find the distance from point $P(1, 2)$ to line L: $x + 2y = 3$ You may use a calculator.

The following 4 problems are for AB/BC calculus

- 21) Graph $x_t = 3t$
 $y_t = 2 - 2t$ from $0 \leq t \leq 1$ (use your calculator). Write a Cartesian equation that models this graph. Identify the initial and terminal point. You may use a calculator.

- 22) Follow the directions in number 21 with the parametric equations $x_t = 2t - 1$
 $y_t = t + 1$ $0 \leq t \leq 2$
You may use a calculator.

- 23) Parametric equations give us the ability to graph curves that are not functions. Graph the following two sets of curves, determine their corresponding Cartesian equation, and tell how you can determine which direction (up/down or left/right) the parabola will open based on their parametric equations. You may use a calculator.

a) $x_t = \frac{t^2}{2}$ $-2 \leq t \leq 2$
 $y_t = t$

b) $x_t = \sqrt{t-1}$ $1 \leq t \leq 5$
 $y_t = t - 1$

- 24) a) Graph and make a sketch of $x = y^2 - 6y + 11$ in function mode. (hint: complete the square and solve for y) Remember about \pm You may use a calculator.
- b) Graph and make a sketch of $x = y^2 - 6y + 11$ in parametric mode. (hint: you need to come up with 2 parametric equations) You may use a calculator.