

NAME: _____

AP CALCULUS (AB) SUMMER SKILLS REVIEW SHEET:

WHY do you need a summer review packet?

*If you plan on taking AP Calculus, there are certain skills that have been taught to you during your school career that I will assume you still possess. If you do not have these skills, you will find that you will consistently get problems incorrect in this class, even if you understand the concepts. It can be very frustrating for students when they are tripped up by the Algebra, instead of by the Calculus. That is why it is **very important** that you complete your summer review packet for the first day of classes.*

*If you find that you do not know some of these concepts, it would be wise to research them before the start of the school year. There are resources on line that can help you. One such resource, Kahn Academy, has videos you can watch for further understanding. If you find that you do not know **much** of this packet, it would probably be best not to venture into AP Calculus until you are better prepared.*

We will review this material during the first few days of class and you will be assessed (tested) on your readiness for AP Calculus (AB) after such review.

Please complete each problem. Be sure to show **all** your work.

You will be graded on your completion of this packet.

You may use a calculator **EXCEPT** where noted.

For some problems, it may be wise to draw a diagram to get a better idea of what you are being asked.

Be sure to read the directions carefully and only answer the question asked (ATQA). This is a practice that is prevalent in the AP Calculus curriculum.

FOR HELP ON MATHEMATICAL TOPICS:

You can do Google searches for any of these topics. Here are several sites that will cover most of these topics.

The following site has tutorials and practice problems: <http://prep.math.lsa.umich.edu/pmc/> . Enter the module and select any topic, or test your overall knowledge with the diagnostic test at the end of the list of topics.

Good Site for Algebra Topics: <http://purplemath.com/modules/index.htm> and

<http://www.themathpage.com/aprecalc/precalculus.htm>

1. Write the equation of the line that goes through the points $(-3, 7)$ and $(4, 5)$ in *point-slope* form:

2. Find an equation of the line tangent to a circle with radius 5 and center $(0, 0)$, at the point $(3, 4)$.

3. For what value of k are the two lines $2x + ky = 3$ and $x + y = 1$ *perpendicular*?

4. What is the domain of the following function: $g(x) = \frac{\log_2(x-5)}{x-8}$

5. Find the domain and range of the following functions. Use interval notation.

a) Absolute value

b) Sine

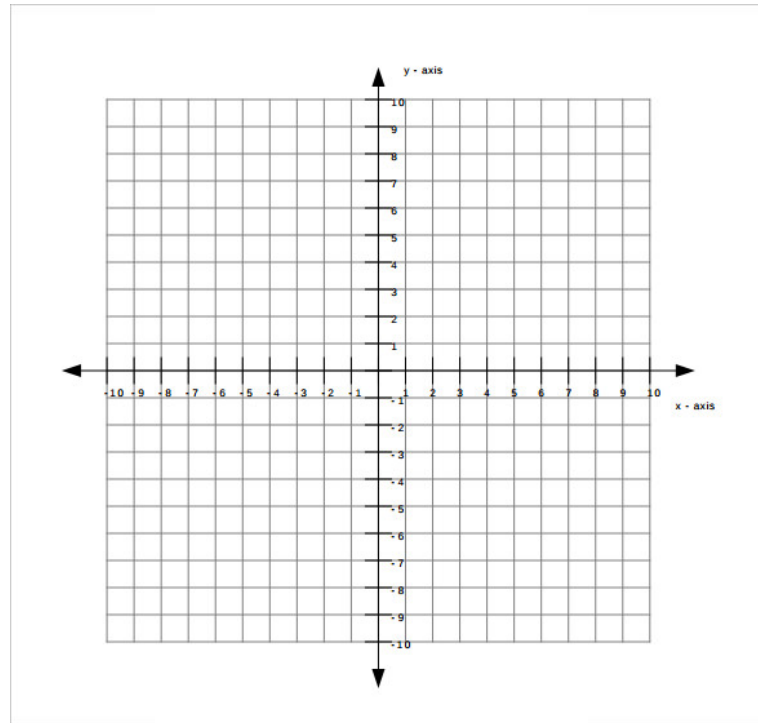
c) Logarithmic

d) Tangent

e) Exponential

6. Graph the following piecewise function:

$$f(x) = \begin{cases} 4 - x^2 & , \text{if } x < 1 \\ \frac{3}{2}x + \frac{3}{2} & , \text{if } 1 \leq x \leq 3 \\ x + 3 & , \text{if } x > 3 \end{cases}$$



7. Find $f(g(x))$ and determine the domain: $f(x) = \frac{4x+1}{x-3}$ and $g(x) = \frac{3x+1}{x-4}$

8. Find the *least common denominator* of the following:

a) $\frac{4}{y+2}$ and $\frac{3+y}{y-1}$

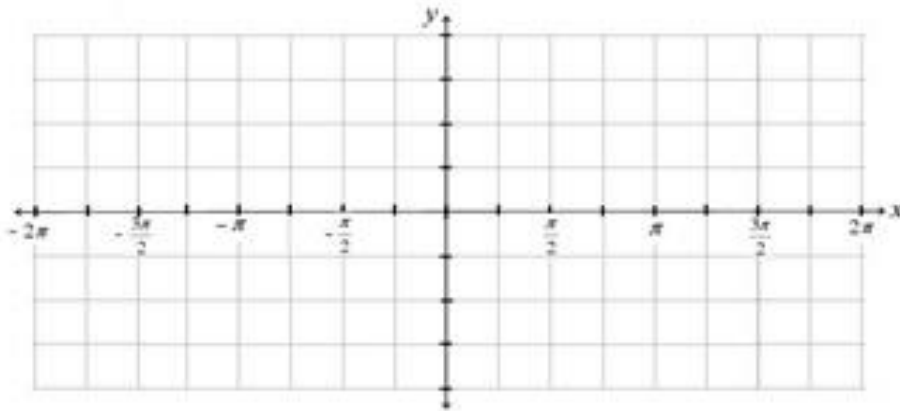
b) $\frac{7x-6}{x^2-7x-8}$ and $\frac{3x}{2x^2-19x+24}$

9. Solve the following equations. Check for extraneous solutions.

a) $\frac{3}{x-4} - \frac{4}{x+4} = \frac{5}{x^2-16}$

b) $\frac{3x}{x+2} - \frac{2}{x-1} = \frac{5}{x^2+x-2}$

10. Graph the following trigonometric function below. List the amplitude, period, phase shift, vertical shift, domain and range. $y = 2\sin\left(2x + \frac{\pi}{3}\right)$



Amp: _____

Period: _____

Phase: _____

Shift: _____

Vertical Shift: _____

Domain: _____

Range: _____

11. Simplify each expression:

a) $\sin^{-1}\left(-\frac{1}{2}\right) =$

b) $\cos^{-1}\left(\frac{-1}{\sqrt{2}}\right) =$

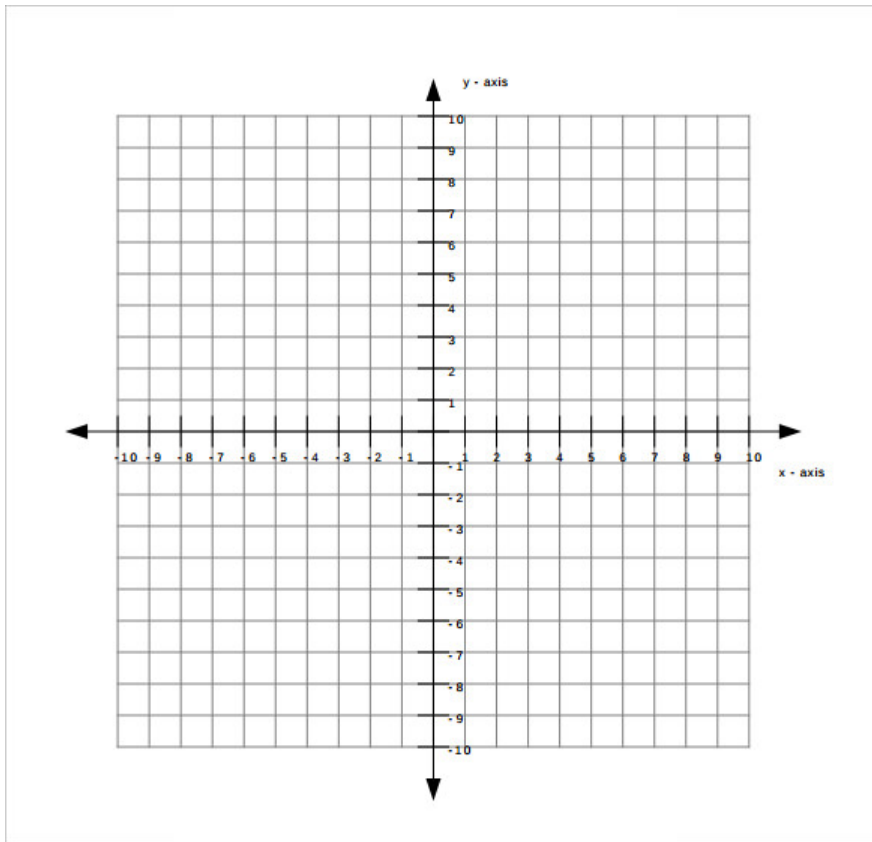
12. Solve the following equations algebraically for the given variable (and interval if appropriate).

a) Solve for t if $0 \leq t \leq 2\pi$: $e^{-t} \cos t + \sin t(-e^{-t}) = 0$

b) Solve for A: $A(-2e^{-t} \cos t) + e^{-t}(\cos t - \sin t) + e^{-t} \sin t = 0$

13. **WITHOUT using a calculator**, evaluate $\sin\left(\cos^{-1}\left(\frac{7}{11}\right)\right)$. SHOW how you got your answer.

14. Graph the following equation: $\frac{(x-8)^2}{3} + \frac{(y+2)^2}{3} = 1$



15. If $\ln(x) - \ln \frac{1}{x} = 2$, solve for x .

16. Fill in the unit circle below with degree in the ovals, radians in the rectangles, coordinates in the (_ , _) and **ADD the TANGENT** values above the coordinates. You will need to know this without referencing a chart in this class.

