

2026-2027 AP Calculus AB – Summer Math Assignment

NAME: _____
AP CALCULUS AB

DATE: _____ BLOCK: _____
SUMMER MATH PACKET 2026

THIS ASSIGNMENT IS DUE THE FIRST DAY OF SCHOOL BY 3:45 PM. NO LATE ASSIGNMENTS WILL BE ACCEPTED. FEEL FREE TO TURN IT IN EARLY BY EMAILING IT TO ME AT VONDA.BAKER@DARLINGTON.K12.SC.US.

A test on this material will be given during the first week of school. This test will be the first grade of the course in the first nine weeks for 2026-2026 school year.

- A] Refer to your pre-calculus notebook, the internet, or the sheet provided for assistance.
- B] Do not wait until the last minute to complete this assignment.
- C] Write neatly and in pencil on your own paper. Number all work.
- D] Show your work (step-by-step solutions) . Circle your final answers.
- E] Round decimal answers to the nearest thousandth.
- F] This is a review of concepts that you have been previously taught. Please be sure to do your own work or your own research of topics.
- G] When graphing functions, use graph paper and plot at least 5 points.
- H] Use the given links for review. Print a copy and keep them in your notebook.

https://www.purplemath.com/	https://www.khanacademy.org/math/ap-calculus-ab
https://www.coolmath.com/algebra	https://www.khanacademy.org/math/prec-calculus
https://www.analyzemath.com/	http://tutorial.math.lamar.edu/pdf/Trig_Cheat_Sheet.pdf
http://www.mathbits.com/MathBits/TeacherResources/PreCalculus/Formula%20Sheet2.pdf	

[1] Difference quotient: Using function notation to write difference quotients is an important skill. If $f(x) = 3x^2 + 4x$, what is ...?

[a] $\frac{f(4)-f(1)}{4-1}$

[b] $\frac{f(x)-f(1)}{x-1}$

[c] $f(x + h)$

[d] $\frac{f(x+h)-f(x)}{h}$

[2] Factor Polynomials: [a] $x^6 - 16x^4$ [b] $4x^3 - 8x^2 - 25x + 50$ [c] $8x^3 + 27$

[d] $x^4 - 1$

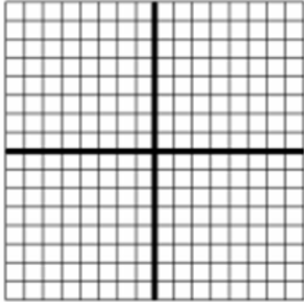
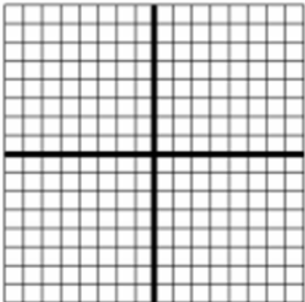
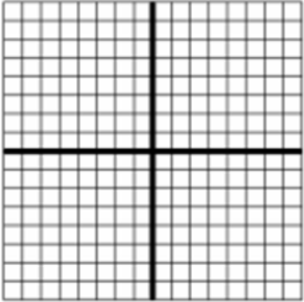
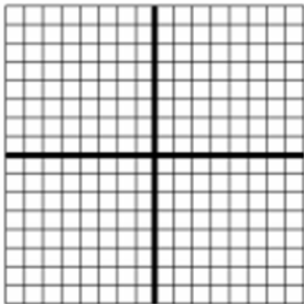
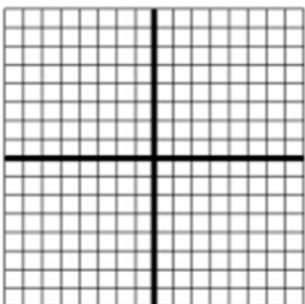
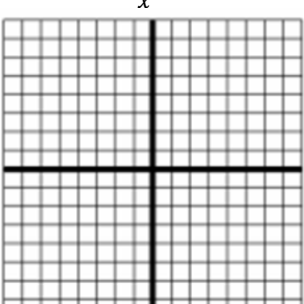
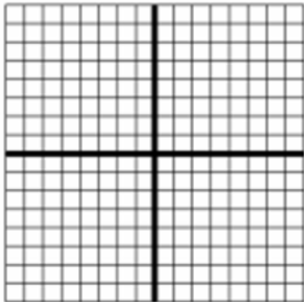
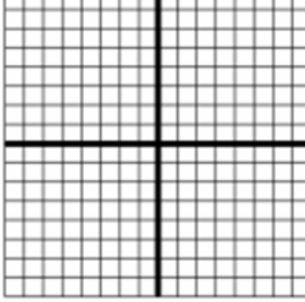
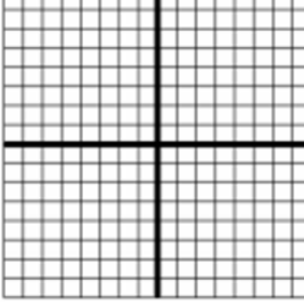
[e] $x^3 - 1$

[3] Pascal's triangle: A] At the right, list the first 5 rows of Pascal's triangle.

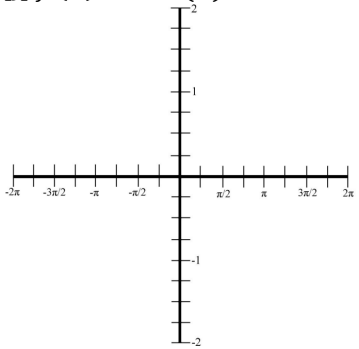
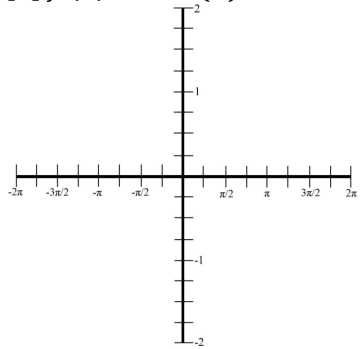
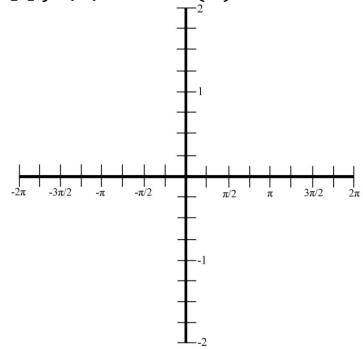
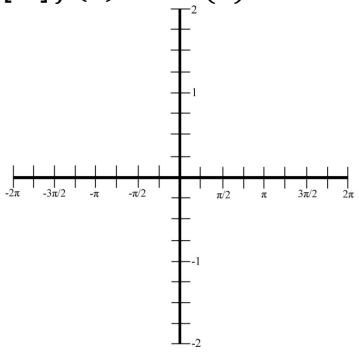
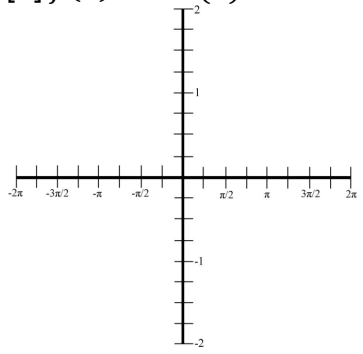
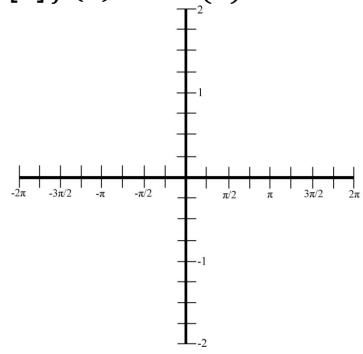
B] Expand and simplify. $(3x - 2)^4$

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[4] Parent Functions: Sketch each parent function on graph paper or the handout provided. Plot at least points and important key features. Identify the name of the function, zeros, domain, range and asymptotes, if any.

[a] $f(x) = x^2$ 	[b] $f(x) = \sqrt{x}$ 	[c] $f(x) = x$ 
Name: _____ Zero(s): _____ Domain: _____ Range: _____	Name: _____ Zero(s): _____ Domain: _____ Range: _____	Name: _____ Zero(s): _____ Domain: _____ Range: _____
[d] $f(x) = x^3$ 	[e] $f(x) = \sqrt[3]{x}$ 	[f] $f(x) = \frac{1}{x}$ 
Name: _____ Zero(s): _____ Domain: _____ Range: _____	Name: _____ Zero(s): _____ Domain: _____ Range: _____	Name: _____ Zero(s): _____ Domain: _____ Range: _____ Asymptote: _____
[g] $f(x) = \frac{1}{x^2}$ 	[h] $f(x) = \ln(x)$ 	[i] $f(x) = e^x$ 
Name: _____ Zero(s): _____ Domain: _____ Range: _____ Asymptote: _____	Name: _____ Zero(s): _____ Domain: _____ Range: _____ Asymptote: _____	Name: _____ Zero(s): _____ Domain: _____ Range: _____ Asymptote: _____

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[j] $f(x) = \sin(x)$ 	[k] $f(x) = \cos(x)$ 	[l] $f(x) = \tan(x)$ 
Name: _____ Zero(s): _____ Domain: _____ Range: _____	Name: _____ Zero(s): _____ Domain: _____ Range: _____	Name: _____ Zero(s): _____ Domain: _____ Range: _____ Asymptote: _____
[m] $f(x) = \csc(x)$ 	[n] $f(x) = \sec(x)$ 	[o] $f(x) = \cot(x)$ 
Name: _____ Zero(s): _____ Domain: _____ Range: _____ Asymptote: _____	Name: _____ Zero(s): _____ Domain: _____ Range: _____ Asymptote: _____	Name: _____ Zero(s): _____ Domain: _____ Range: _____ Asymptote: _____

[5] Evaluating trig functions in RADIANS only

[a] Trig Radian	$\sin \theta$	$\cos \theta$	$\tan \theta$	$\csc \theta$	$\sec \theta$	$\cot \theta$
$0, 2\pi$						
$\pi/6$						
$\pi/4$						
$\pi/3$						
$\pi/2$						
π						
$\frac{3\pi}{2}$						
$\frac{3\pi}{4}$						
$\frac{5\pi}{6}$						

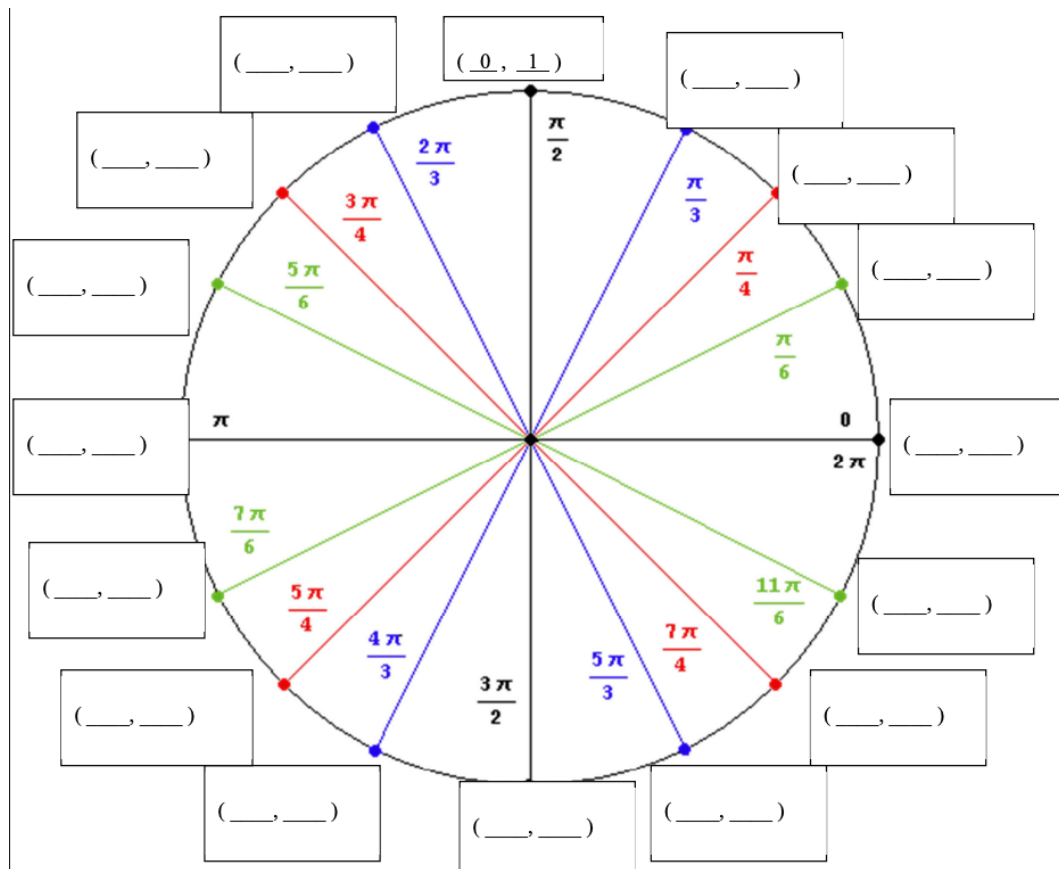
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Find x where $0 \leq x \leq 2\pi$. [b] $\sin x = \frac{1}{2}$

[c] $\tan x = 0$

[d] $\cos x = -1$

[6] Unit circle: Complete the unit circle. Fill in the ordered pairs.



[7] Simplifying Rational Expressions

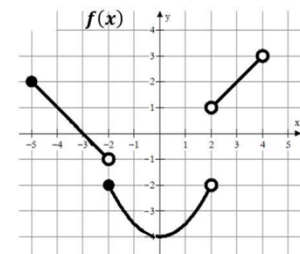
[a] $\frac{x^3-9x}{x^2-7x+12}$

[b] $\frac{x^2-2x-8}{x^3+x^2-2x}$

[c] $\frac{\frac{1}{x} - \frac{1}{5}}{\frac{1}{x^2} - \frac{1}{25}}$

[d] $\frac{9-x^{-2}}{3+x^{-1}}$

[8] Piecewise functions



Evaluate $f(x)$ at each x , if possible.

$$[a] f(0) =$$

$$[b] f(4) =$$

$$[c] f(-1) =$$

$$[d] f(-2) =$$

$$[e] f(2) =$$

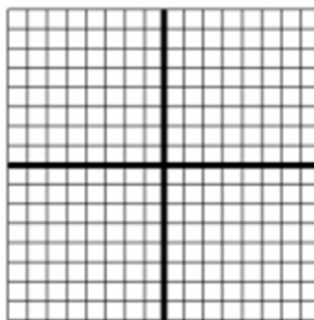
$$[f] f(3) =$$

[g] $f(x) = 2$ when $x = ?$ [h] $f(x) = -3$ when $x = ?$

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[i] Graph the piecewise function.

$$f(x) = \begin{cases} 2x - 3, & x \leq 3 \\ (x - 6)^2 - 2, & x > 3 \end{cases}$$



[j] Write the absolute value function as a piecewise function. $f(x) = |5x - 2|$

[9] **Horizontal asymptotes and Vertical asymptotes:** Find the horizontal asymptote(s), vertical asymptote(s) and hole(s), if any, of each function.

[a] $y = \frac{1}{x-1} - 7$

[b] $y = \frac{2x^2 - 7x - 4}{6x^2 + 7x + 2}$

[c] $y = \frac{5x^2 + 20x}{x^3 - 3x^2 - 28x}$

[10] **Rationalize the Denominator:** [a] $\frac{2}{\sqrt{3} + \sqrt{2}}$

[b] $\frac{4}{a - \sqrt{5}}$

[11] **Using Graphing Calculator:** Find all roots to the nearest thousandth.

[a] $f(x) = 3 \sin(2x) - 4x + 1$ from $[-2\pi, 2\pi]$ [b] $f(x) = x^4 - 8x^2 + 5$

[c] Find the coordinates of any points of intersection $f(x)$ and $g(x)$.

$$f(x) = x^2 - 5x + 2 \text{ and } g(x) = 3 - 2x$$

[12] **Trigonometric Identities**

[a] $\sin^2 x + \cos^2 x =$ _____ [b] $1 + \tan^2 x =$ _____ [c] $\cot^2 x + 1 =$ _____

[d] $\sin 2x =$ _____ [e] $\cos 2x =$ _____ = _____ = _____

[13] **Domain & Range:** Find the domain and range of each function.

[a] $f(x) = \sqrt{x - 4}$

[b] $y = \sqrt{4 - x^2}$

[c] $g(x) = \frac{x}{\sqrt{14 - 2x}}$