

AP Summer Assignment

Course: Advanced Placement Calculus BC

Assignment title	Summer Assignment
Date due	The first day of class.
Estimated time for completion	6- 8 hours
Resources needed to complete assignment	<input type="checkbox"/> Textbook assigned by school <input type="checkbox"/> Book(s) supplied by student <input checked="" type="checkbox"/> Other supplies: Problems 1-20 and answer sheet attached
How the assignment will be assessed	Assignment will count as a test grade. Assignment must be completed independently.
Purpose of assignment	<input checked="" type="checkbox"/> Review foundational material/concepts/skills. <input type="checkbox"/> Expose students to required material/concepts/skills/texts that cannot entirely be covered during the academic year. <input type="checkbox"/> Have students read material that will be discussed or used in class at the beginning of the year.



AP Calculus BC Summer Packet Exercises

These exercises represent some of the more fundamental concepts that you are expected to know from Analysis as you enter AP Calculus BC. As you work on these problems, you might encounter concepts that you have forgotten. There are many resources available (Internet, books, etc.) that you can use to get help.

These exercises are expected to be completed and are due the first day of class.

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1. Find the equation of the line that passes through $(2, -1)$ and is perpendicular to the line $2x - 3y = 5$.

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2. Graph without a calculator:

a) $y = (x - 3)^2 + 2$

b) $y = (x + 1)^3$

c) $y = 2 - \sqrt{x}$

d) $y = e^{-x}$

e) $y = \ln(x - 1)$

f) $y = \sqrt[3]{1 - x}$

g) $y = 2\sin x$

h) $y = \cos \pi x$

i) $y = \tan x + 1$

j) $y = 2|x - 3|$

k) $y = \frac{1}{x+1}$

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3. Graph and label all asymptotes of $y = \frac{2x}{x-4}$.

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4. Graph $(x - 2)^2 + y^2 = 5$ and $(y + 2)^2 - x^2 = 16$.

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5. Which relations are functions?

a) $xy = 3$

b) $\sqrt{y} = 2x$

c) $xy^2 = 7$

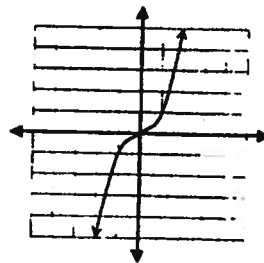
d) $x + 3y = 5$

e) $x^2 + (y - 2)^2 = 4$

f) $\frac{1}{x} + 2y = 9$

g) $y^2 = x^2 + 3$

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6. Find the domain, range, and inverse of the graph.



7. If $f(x) = \frac{x}{x-1}$ and $g(x) = \frac{1}{x-1}$, find $(f \circ g)(x)$.

8. Solve the following.

a) $4t^3 - 12t^2 + 8t = 0$ b) $3\sqrt{x-2} - 8 = 8$ c) $2\ln 3x = 4$
d) $\frac{x-5}{3-x} \geq 0$ e) $\left|2 - \frac{x}{3}\right| < 5$ f) $4e^{2x} = 5$
g) $(x-4) - 5(x-4)^{\frac{1}{2}} = 6$ h) $2\sin^2 x = \sin x + 1; 0 \leq x \leq 2\pi$

9. Solve algebraically $\begin{cases} 5a + 3b = 9 \\ 2a - 4b = 14 \end{cases}$.

10. Solve using matrices $\begin{cases} x + 4z = 13 \\ 4x - 2y + z = 6 \\ 2x - 2y + 7z = 10 \end{cases}$

11. Factor a) $3x^3 + 192$ b) $2x^3 - 11x^2 + 12x + 9$
c) $2x^{\frac{1}{2}} + x^{\frac{1}{2}} - 15x^{\frac{1}{2}}$ d) $9x^2 - 3x - 2$

12. Simplify the following. a) $2\ln(x-3) + \ln(x+2) - 6\ln x$
b) $\frac{\frac{2}{x} - 3}{1 - \frac{1}{x-1}}$ c) $x(1-2x)^{-\frac{1}{2}} + (1-2x)^{-\frac{1}{2}}$

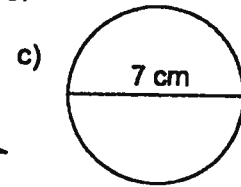
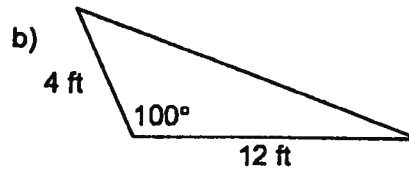
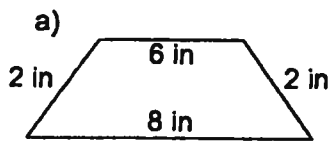
13. Suppose $A = \begin{bmatrix} 2 & 3 & 6 \\ 4 & -2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 2 & 1 & 0 \end{bmatrix}$. Find $2A \times B$ and $2B \times A$.

14. Simplify a) i^{27} b) $(7+3i)(5-i)$

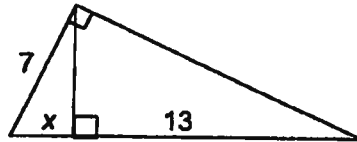
15. Find the distance between $(\frac{1}{2}, -7)$ and $(-3, 4)$.

16. Find each summation. a) $\sum_{i=1}^n 3\left(\frac{1}{2}\right)^{i-1}$ b) $\sum_{i=1}^n (i^2 - 3i + 2)$

17. Find the area and perimeter (or circumference) of each figure.



18. Find x .



19. Find the following.

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

b) $\cos 120^\circ$

c) $\tan \frac{\pi}{2}$

d) $\csc 60^\circ$

e) $\sec\left(-\frac{2\pi}{3}\right)$

f) $\cot(-135^\circ)$

20. Simplify.

a) $4\sin 2x \cos 2x$

b) $1 - \sec^2 x$

c) $\frac{1 + \cos 2x}{2}$

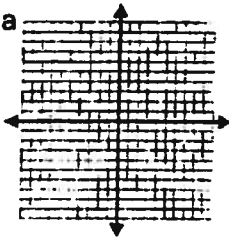
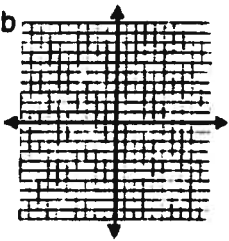
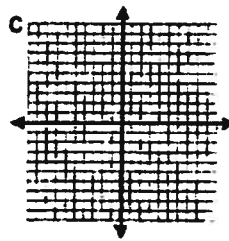
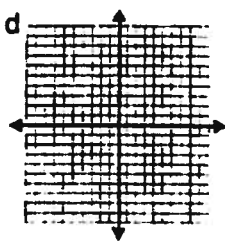
d) $\cos^2 x - \sin^2 x$

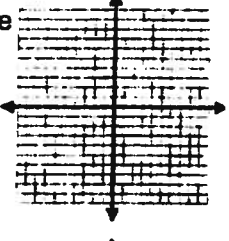
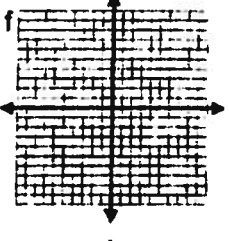
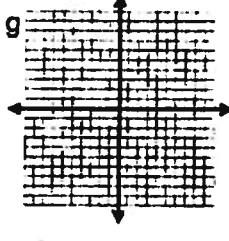
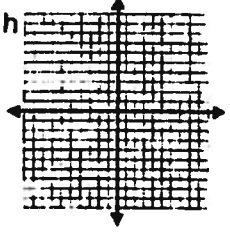
e) $\cos^2 x + \sin^2 x$

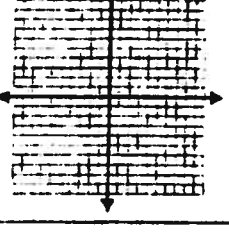
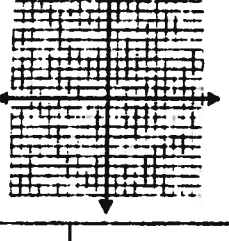
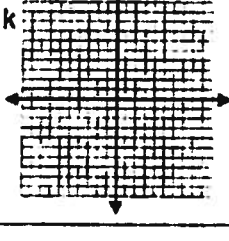
AP Calculus BC Summer Packet Answer Sheet

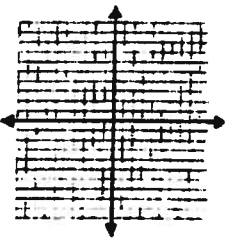
Write your answers in the spaces provided.

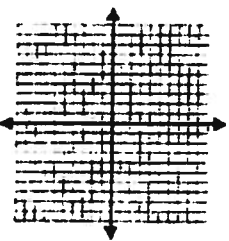
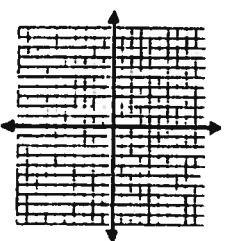
1.

2. a  b  c  d 

e  f  g  h 

i  j  k 

3. 

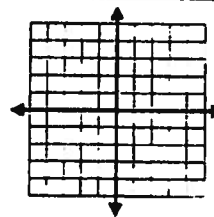
4.  

5 a _____ b _____ c _____ d _____
e _____ f _____ g _____

6. Domain _____

Inverse

Range _____



7.

8. a _____

b _____

c _____

d _____

e _____

f _____

g _____

h _____

9.

10.

11. a _____

b _____

c _____

d _____

12. a _____

b _____

c _____

13. $2A \times B$

$2B \times A.$

14. a _____

b _____

15.

16. a _____

b _____

17. a _____

b _____

c _____

18.

19. a _____

b _____

c _____

d _____

e _____

f _____

20. a _____

b _____

c _____

d _____

e _____
