SJHS AP Calculus BC

Summer Assignment 2016

The attached assignment contains information you will need to know for AP Calculus BC. You are to read the information and work through the assigned problems during your summer break. You should have all work done and ready to turn in on August 10, 2016. You will have a test on this material on Friday, August 12th. Do not wait until the week before school starts to begin this assignment. Work on it a little each day and before you know it you will be finished. If you need examples to help you with these problems, khanacademy.org is a great resource. If you lose the packet, it's available on the SJHS website. I will be available at amanda.webb@stjosephhs.org if you have questions on the assignment throughout the summer.

<u>Remember:</u>

1. Do a little each day.
2. Show ALL work.
3. Be neat. Be very neat!!
4. Do all problems in the packet.
   a. Don't simplify (unless instructed)
   b. Don't rationalize (unless instructed)
5. Have it all put together and ready to turn in August 10, 2016.
6. You can email me (amanda.webb@stjosephhs.org) at any time during the summer if you are having trouble!

Have a great summer!! ☺

Name_____

Date_____ Period_____

Find the next three terms in each sequence.

1) 1, −3, 9, −27, 81, ...

2) 9, 109, 209, 309, 409, ...

3) 0, 3, 8, 15, 24, ...

4) $\dfrac{1}{2}, \dfrac{1}{2}, \dfrac{3}{8}, \dfrac{1}{4}, \dfrac{5}{32}, ...$

5) 4, 16, 36, 64, 100, ...

6) 14, 34, 54, 74, 94, ...

7) 5, $\dfrac{5}{2}, \dfrac{5}{4}, \dfrac{5}{8}, \dfrac{5}{16}, ...$

8) −9, 101, −999, 10001, −99999, ...

Find the tenth term in each sequence.

9) −1, $\dfrac{2}{3}, \dfrac{7}{3}, 4, \dfrac{17}{3}, ...$

10) 7, 9, 12, 16, 21, ...

11) −2, −6, −18, −54, −162, ...

12) −23, −18, −13, −8, −3, ...

13) −4, 12, −36, 108, −324, ...

14) −6, −2, 0, 1, $\dfrac{3}{2}, ...$

15) −28, 172, 372, 572, 772, ...

16) 37, 46, 55, 64, 73, ...

Find the first four terms in each sequence.

17) $a_n = \dfrac{2n + 1}{n^3}$

18) $a_n = 3^{n-1}$

19) $a_n = n^2 + 1$

20) $a_n = \dfrac{n^3}{2n + 1}$

Find the tenth term in each sequence.

21) $a_n = \dfrac{2n+1}{n^3}$

22) $a_n = 4^{n-1}$

23) $a_n = (2n)^2$

24) $a_n = (2n-1)^2$

Find the first four terms in each sequence.

25) $a_n = a_{n-1} + 10$
$a_1 = 29$

26) $a_n = a_{n-1} \cdot 2$
$a_1 = -1$

27) $a_n = a_{n-1} + n$
$a_1 = -4$

28) $a_n = \dfrac{2 + a_{n-1}}{2}$
$a_1 = 10$

Find the tenth term in each sequence.

29) $a_n = na_{n-1}$
$a_1 = -1$

30) $a_n = a_{n-1} + 10$
$a_1 = 11$

31) $a_n = a_{n-1} \cdot 3$
$a_1 = -3$

32) $a_n = \dfrac{2 + a_{n-1}}{2}$
$a_1 = -14$

Write the explicit formula for each sequence.

33) $-12, -9, -6, -3, 0, \ldots$

34) $-6, -3, -2, -\dfrac{3}{2}, -\dfrac{6}{5}, \ldots$

Write the recursive formula for each sequence.

35) $2, 4, 7, 11, 16, \ldots$

36) $15, 215, 415, 615, 815, \ldots$

Factorials Worksheet

1. Can a factorial be defined for a negative number?

2. Express in factorial form:

    a) 6x5x4x3x2x1
    b) 8x7x6x5x4x3x2x1
    c) 3x2x1
    d) 9x8x7x6x5x4x3x2x1

3. Match each expression on the left with an equivalent expression on the right.

A	$\dfrac{14!}{13!}$
B	$\dfrac{52!}{51!}$
C	$\dfrac{101!}{99!}$
D	$20 \times 19!$
E	$90 \times 8!$
F	$30 \times 4!$

Letter	
1	10100
2	6!
3	52
4	10!
5	14
6	20!

4. Determine the value for each expression. Simplify fully before using a calculator.

    a) $\dfrac{8!}{5!}$ b) $\dfrac{19!}{13!}$ c) $\dfrac{21!}{17!4!}$ d) $\dfrac{9!}{7!2!}$ e) $\dfrac{155!}{152!}$ f) $\dfrac{93!}{89!4!}$

5. Determine the value for each expression. Simplify fully before using a calculator.

    a) $\dfrac{10!}{5!}$ b) $\dfrac{21!}{14!}$ c) $\dfrac{9!}{3!6!}$ d) $\dfrac{12!}{8!4!}$ e) $\dfrac{7!}{2!5!} + \dfrac{7!}{4!3!}$

    f) $\dfrac{15!}{9!6!} + \dfrac{15!}{10!5!}$ g) $2 \times \dfrac{5!}{2!3!}$ h) $3 \times \dfrac{11!}{7!4!}$

6. Simplify fully

a) $12 \times 11 \times 10 \times 9!$

b) $72 \times 7!$

c) $n(n-1)!$

d) $n!(n+1)$

e) $(n-1)!(n^2+n)$

f) $(n+4)(n+5)(n+3)!$

g) $n!(n^2+3n+2)$

h) $\dfrac{n!}{(n-2)!}$

i) $\dfrac{(n+2)!}{(n-1)!}$