



# AP Calculus BC Summer Assignment

(for students who have **completed** AP Calculus AB and are **entering** AP Calculus BC)

This review packet is designed to help you prepare for your next math class.

## Instructions:

- Start this review packet 2 weeks prior to the start of the school year.
- An answer key is provided so that you may check your work, however, ensure your work is shown to receive full credit.
- The problem set is **non calculator**.
- The following are the topics covered in the assignment. You may use external sources, like Khan Academy, to help you review, if needed.
  - Arithmetic sequences and series
  - Geometric sequences and series
  - Parametric equations
  - Polar points and equations
- In addition to this problem set, review your AP Calculus AB material. College Board has a public practice exam from 2012 that you may lookup and use if you would like some extra practice problems.
- Expect to submit this completed packet on the first day of school and plan to be assessed on these skills at the beginning of the school year.

If you would like additional resources to support your practice, we recommend Khan Academy as a great first step. For in-person support, consider a peer tutor or a more structured option such as Mathnasium. For a list of peer tutors who are willing to tutor over the summer for community service hours, please contact Linda Graham, Math Department Chair.

Name: \_\_\_\_\_



## BC Calc summer practice

Date \_\_\_\_\_ Period \_\_\_\_\_

**Determine if the sequence is arithmetic. If it is, find the common difference, the 52nd term, and the explicit formula.**

1)  $-12, -3, 6, 15, \dots$

2)  $37, 44, 51, 58, \dots$

**Evaluate the related series of each sequence.**

3)  $29, 36, 43, 50$

4)  $25, 31, 37, 43, 49, 55, 61$

**Determine if the sequence is geometric. If it is, find the common ratio, the 8th term, and the explicit formula.**

5)  $-3, -6, -12, -24, \dots$

6)  $3, 6, 12, 24, \dots$

**Evaluate each geometric series described.**

7)  $4 + 8 + 16 + 32\dots, n = 6$

8)  $-1 - 4 - 16 - 64\dots, n = 8$

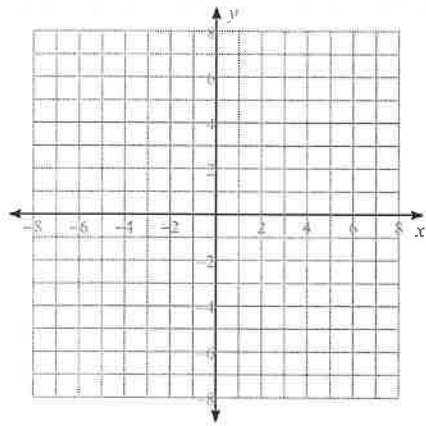
**Rewrite each series using sigma notation.**

9)  $4 + 16 + 64 + 256$

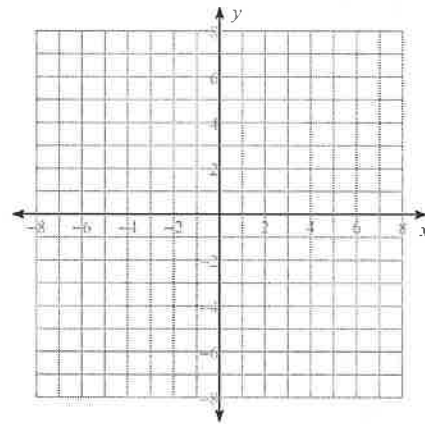
10)  $5 + 25 + 125 + 625$

Write each pair of parametric equations in rectangular form. Then sketch the curve.

11)  $x = 4\sin t, y = 4\cos t$

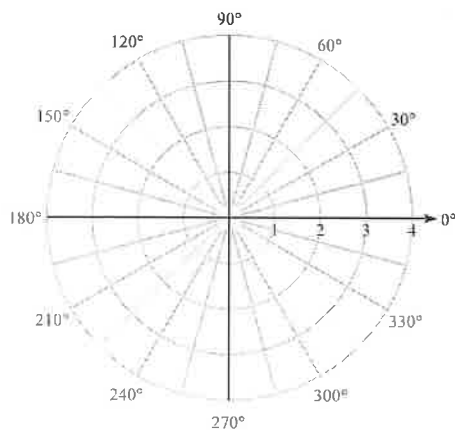


12)  $x = t, y = -\frac{t^2}{4}$

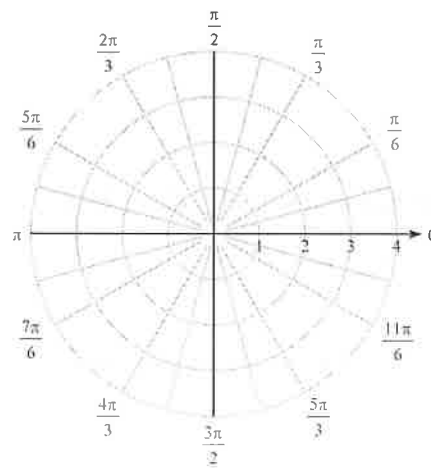


Plot the point with the given polar coordinates.

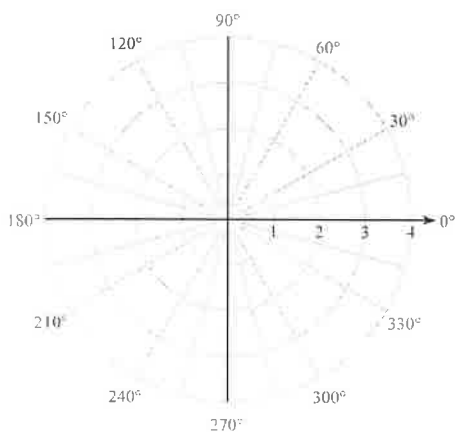
13)  $(1, 75^\circ)$



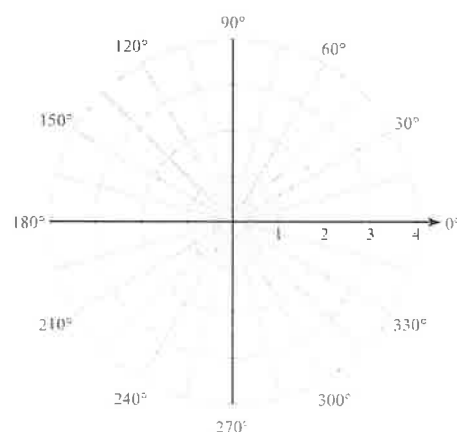
14)  $(4, \frac{5\pi}{4})$



15)  $(2, 150^\circ)$



16)  $(2, 315^\circ)$



Convert each equation from rectangular to polar form.

17)  $(x + 2)^2 + (y + 1)^2 = 5$

18)  $x = \frac{y^2}{5}$

## Answers to BC Calc summer practice (ID: 1)

- 1) Common Difference:  $d = 9$       2) Common Difference:  $d = 7$       3) 158

$$a_{52} = 447$$

$$a_{52} = 394$$

$$\text{Explicit: } a_n = -21 + 9n$$

$$\text{Explicit: } a_n = 30 + 7n$$

- 4) 301

- 5) Common Ratio:  $r = 2$

- 6) Common Ratio:  $r = 2$

$$a_8 = -384$$

$$a_8 = 384$$

$$\text{Explicit: } a_n = -3 \cdot 2^{n-1}$$

$$\text{Explicit: } a_n = 3 \cdot 2^{n-1}$$

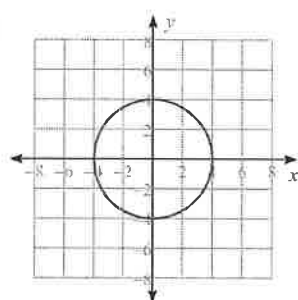
- 7) 252

- 8) -21845

$$9) \sum_{n=1}^4 4^n$$

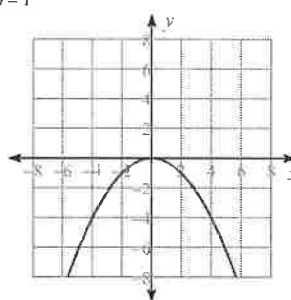
$$10) \sum_{k=1}^4 5^k$$

- 11)



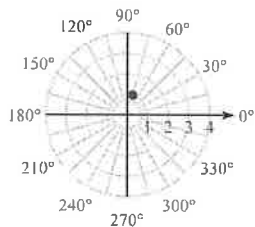
$$\frac{x^2}{16} + \frac{y^2}{16} = 1$$

- 12)

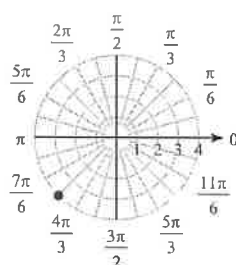


$$y = -\frac{x^2}{4}$$

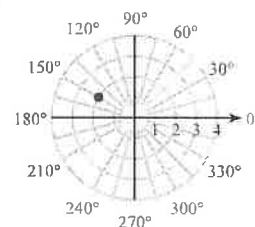
- 13)



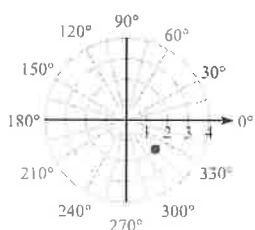
- 14)



- 15)



- 16)



- 17)  $r = -4\cos \theta - 2\sin \theta$

- 18)  $r = 5\cot \theta \csc \theta$