Name:_____ Date:_____

Math 10/11 Honors: Section 3.1 Arithmetic Sequences and Series

1. Given each arithmetic sequence, find the value of the missing term:

a) $4,\ 10,\ 16,\ 22,\ .....t_{10}$	b) $-24,\ -12,\ 0,\ 12,\ .....t_9$
c) $\frac{24}{5},\ \frac{14}{5},\ \frac{4}{5},\ \frac{-6}{5},\ .....t_8$	d) $\frac{22}{3},\ \frac{47}{6},\ \frac{25}{3},\ \frac{53}{6},\ .....t_8$
e) $a=-4,\ d=5,\ .....t_6$	f) $2x+1,\ 4x,\ 5x+2,.....t_6$

2. Given each arithmetic sequence, find out how many terms there are and the sum of the sequence. Show all your work and steps for each question:

a) $5,\ 9,\ 13,..... 209$ Number of terms: Sum:	b) $-210,\ -207.5,\ -205,.....45$ Number of terms: Sum:
c) $\frac{1}{2},\ \frac{7}{6},\ \frac{11}{6},..... \frac{29}{2}$ Number of terms: Sum:	d) $\frac{4}{5},\ \frac{2}{15},\ \frac{-8}{15},..... \frac{-126}{5}$ Number of terms: Sum:

e) $x-8,\ x-2,\ 2x-1,\ldots.\ 35x+2$	f) $7-x^2,\ x+7,\ 2x^2-1,\ldots.\ 6x^3+47$
Number of terms: Sum:	Number of terms: Sum:

3. What is the arithmetic mean of 3, 5, 9, 12, and 21?
   a)3 b) 5 c) 9 d) 10 e) 18

4. What is the seventh term of an arithmetic sequence with a first term of nine and a common difference of twelve?

5. If the first four terms of an arithmetic sequence are a, $2a$, b, and $a-6-b$ for some numbers a and b, then the value of the 100th term is
   a) -100 b) -300 c) 150 d) -150 e) 100

6. Let T_n be the nth term of a sequence, where "n" is a natural number. Which of the following is/are arithmetic sequences?
   i) $T_n = 2n-3$ ii) $T_n = 3^n$ iii) $T_n = n^2$

7. In an arithmetic sequence, the 3rd term is "x" and the 5th term is "y". Which expression is the first term?
   i) $2x-y$ ii) $2x+y$ iii) $2y-x$ iv) $2y+x$

8. Consider the following arithmetic sequence, which term is the first positive term? $-16,\ -14.75,\ -13.5...$

9. the nth term of an arithmetic sequence is given by the formula $T_n = 3n-1$. What is the sum of the first "n" terms of this series?
   i) $\frac{n(2n+1)}{2}$ ii) $\frac{n(2n-1)}{2}$ iii) $\frac{n(3n+1)}{2}$ iv) $\frac{n(3n-1)}{2}$

10. An increasing sequence is formed so that the difference between consecutive terms is a constant. If the first four terms of this sequence are x, y, $3x+y$, and $x+2y+2$, then the value of $y-x$ is
    a) 2 b) 3 c) 4 d) 5 e) 6

11. Four numbers are in an arithmetic sequence and their sum is 82. The sum of the first and third term is 30. The 4th term is greater than the 2nd term by how much?

12. In a sequence of positive number, each term after the first two terms is the sum of *all the previous terms*. If the first term is a, the second term is 2, and the sixth term is 56, then the value of a is
    a) 1 b) 2 c) 3 d) 4 e) 5

13. The sum of the arithmetic series (-300)+(-297)+(-294)+…+306+309 is
    a) 309 b) 927 c) 615 d) 918 e) 18

14. What is the sum of all the integers between 1 and 300 which are divisible by 7?

15. A nine term arithmetic sequence $a_1, a_2, ..., a_8, a_9$ satisfies $a_5 + a_7 = -17$ and $a_4 + a_6 = 1$. What is the sum of the terms of the sequence?

16. The arithmetic sequence a, $a+d$, $a+2d$, $a+3d$, …, $a+(n-1)d$ has the following properties:
    - When the first, third, and fifth, and so on terms are added, up to and including the last term, the sum is 320.
    - When the first, fourth, seventh, and so on, terms are added, up to and including the last term, the sum is 224.

    What is the sum of the whole sequence?
    a)656 b) 640 c) 608 d) 704 e) 672

17. A sequence of three real number forms an arithmetic progression with a first term of 9. If 2 is added to the second term and 20 is added to the third term, the three resulting number form a geometric progression. What is the smallest possible value for the third term of the geometric progression?
    a) 1 b) 4 c) 36 d) 49 e) 81