Name _____ Period _____ Date _____

Chapter 11 Review

Although the following formulas will be provided on the exam, you still need to know when to use a specific formula.

$$a_n = a_1 r^{n-1} \qquad a_n = a_1 + (n-1)d \qquad S_n = n\left(\frac{a_1 + a_n}{2}\right)$$

$$S = \frac{a_1}{1-r} \qquad S_n = a_1\left(\frac{1-r^n}{1-r}\right)$$

1) Fill in the following table with the above formulas:

	ARITHMETIC	GEOMETRIC
Rule OR General Term of a Sequence	$a_n = a_1 + (n-1)d$	$a_n = a_1 r^{n-1}$
Sum of First *n* Terms in a Series	$S_n = n\left(\frac{a_1 + a_n}{2}\right)$	$S_n = a_1\left(\frac{1-r^n}{1-r}\right)$

Identify whether the sequence is *arithmetic*, *geometric*, or *neither*. Then write its general term (or rule).

2) $1, 0, -2, -5, \ldots$ N

3) $2, -2, 2, -2, \ldots$ G $a_n = 2(-1)^{n-1}$

4) $1, -2, -5, -8$ A $a_n = 4 - 3n$

5) $1, -2, 3, -4, \ldots$ N

Find the term given the rule of the sequence.

6) The tenth term in $a_n = 17 - 5n$ -33

7) The 23rd term in $a_n = 3 - 2n$ -43

8) The first term in $a_n = 3n + 1$ 4

First identify whether the series is finite or infinite. Then write the series using summation notation:

9) $1+5+9+13+17$ F $\sum_{n=1}^{5} -3+4n$

10) $-3+3+9+15+21+\ldots$ Inf. $\sum_{n=1}^{\infty} -9+6n$

11) $7+8+9+10+11+12$ F $\sum_{n=7}^{12} n$

Expand using summation notation and find the sum:

12) $\sum_{n=1}^{6} 3n$ 63

13) $\sum_{n=0}^{4} n^2$ 30

14) $\sum_{k=1}^{5} (k^2 - 1)$ 50

15) $\sum_{n=1}^{5} \frac{n}{n+1}$ 3.55

Name _____ Period _____ Date _____

Write the general term (rule) of each sequence:

16) $5, 10, 20, 40, \ldots$ $a_n = 5(2)^{n-1}$

17) $-1, 0, 1, 2, \ldots$ $a_n = n - 2$

18) $2, \frac{4}{3}, \frac{8}{9}, \ldots$ $a_n = 2\left(\frac{2}{3}\right)^{n-1}$

Find the A) sum of the first n terms of each arithmetic series and B) find the n for the given s_n

19) $2+3+4+5+6+\ldots$ 230; 100
$n = 20$
$s_n = 5,150$

21) $2 + \frac{5}{2} + 3 + \frac{7}{2} + 4 \ldots$ $n = 50$ 712.5
$s_n = 1,005$ 60

20) $25 + 35 + 45 + 55 + \ldots$ 1425; 23
$n = 15$
$s_n = 3,105$

22) $9 + 13 + 17 + 21 + 25 + \ldots$ 490; 32
$n = 14$
$s_n = 2,272$

Find the A) sum of the first n terms of each geometric series and B) find the n for the given s_n

23) $1+(-4)+16+(-64)+\ldots$
$n = 20$ 13,107
$s_n = 5,150$ 6

25) $1 + 4 + 16 + 64 + \ldots$ 349,525
$n = 10$ 8
$s_n = 21,845$

24) $-2 + 3 + (-\frac{9}{2}) + \frac{27}{4} + \ldots$ $n = 14$
$s_n = -31.55$

-232.74; 9

Write the general term (rule) of each sequence:

26) $a_1 = \frac{37}{3}; d = \frac{5}{3}$ $a_n = \frac{32}{3} + \frac{5}{3}n$

29) $a_1 = 4; r = \frac{1}{8}$ $a_n = 4\left(\frac{1}{8}\right)^{n-1}$

27) $a_1 = 45; r = \frac{1}{3}$ $a_n = 45\left(\frac{1}{3}\right)^{n-1}$

30) $d = 8; a_1 = -14$ $a_n = -22 + 8n$

31) $r = \frac{1}{2}; a_1 = -40$ $a_n = -40\left(\frac{1}{2}\right)^{n-1}$

28) $d = -6; a_1 = 62$
$a_n = 68 - 6n$

Find the sum of the infinite geometric series if it has one.

32) $\sum_{n=1}^{\infty} 4\left(-\frac{1}{3}\right)^{n-1}$ 3

33) $\sum_{n=0}^{\infty} 2\left(\frac{5}{4}\right)^{n}$ no sum

34) $\sum_{n=0}^{\infty} -7\left(\frac{1}{3}\right)^{n}$ $-21/2$

35) $\sum_{n=1}^{\infty} -4\left(\frac{1}{6}\right)^{n-1}$ $-24/5$

Name _____ Period _____ Date _____

Find the common ratio of the infinite geometric series with the given sum and first term.

36) $S = 4$, $a_1 = 7$ $-3/4$

37) $S = \frac{8}{9}$, $a_1 = \frac{2}{3}$ $1/4$

38) $S = \frac{16}{3}$, $a_1 = 8$ $-1/2$