Sequences and Series Test C Name_____

Find the sum of the arithmetic sequence.

1) 40, 42, 44, 46, ..., 62

A) 64 B) 504 C) 612 D) 480

Solve.

2) A ball is dropped from a height of 3.0 m. On each upward bounce the ball returns to $\frac{2}{3}$ of its previous height.

Find the total vertical distance the ball travels before coming to rest.

3) An auditorium has 25 rows with 10 seats in the first row, 12 in the second row, 14 in the third row, and so forth. How many seats are in the auditorium?

4) Simplify the factorial expression.

$$\frac{(5n+4)!}{(5n+9)!}$$

Write the sum using summation notation, assuming the suggested pattern continues.

5) 1 + 4 + 9 + 16 + 25 + ...

A) $\sum_{n=0}^{\infty} n^2$ B) $\sum_{n=1}^{\infty} (n+1)^2$ C) $\sum_{n=1}^{\infty} n^2$ D) $\sum_{n=0}^{\infty} (n-1)^2$

6) -8 - 7 - 6 - 5 + ... + 7

A) $\sum_{n=0}^{\infty} -8n$ B) $\sum_{n=0}^{15} -8n$ C) $\sum_{n=0}^{15} (-8 + 1n)$ D) $\sum_{n=0}^{\infty} (-8 + 1n)$

7) $5 - 25 + 125 - 625 + \ldots$

A) $\sum_{n=0}^{\infty} 5 \cdot 5^{n+1}$ B) $\sum_{n=0}^{\infty} 5(-5)^{n}$ C) $\sum_{n=0}^{\infty} 5 \cdot 5^{n}$ D) $\sum_{n=0}^{\infty} 5(-5)^{n+1}$

8) Use sigma notation to write the sum

$1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \frac{1}{16} - ,\ldots$

Determine whether the infinite geometric series converges. If the series converges, determine the sum.

9) $3 + 6 + 12 + 24 + \ldots$

A) Diverges B) Converges; 93 C) Converges; 21 D) Converges; 45

10) $60 - 12 + \frac{12}{5} - \frac{12}{25} + \ldots$

A) Converges; 75 B) Diverges C) Converges; 6240 D) Converges; 50

Express the rational number as a fraction of integers. Show all your work.

11) 0.6666 . . .

Find an explicit rule for the nth term of the geometric sequence.

12) The second and fifth terms of a geometric sequence are -36 and 2304, respectively.

13) $-1, -3, -9, -27, \ldots$

A) $a_n = 3 \cdot -1^{n+1}$ B) $a_n = 3 \cdot -1^{n}$ C) $a_n = -1 \cdot 3^{n}$ D) $a_n = -1 \cdot 3^{n-1}$

Using the recursive rule, find the first six terms of the sequence.

14) $a_1 = 7, a_n = a_{n-1} + 5$

A) 12, 17, 22, 27, 32, 37 B) 0, 5, 10, 15, 20, 25 C) 7, 5, 10, 15, 20, 25 D) 7, 12, 17, 22, 27, 32

15) $a_1 = 5, a_n = 2 \cdot a_{n-1}$

A) 5, 10, 12, 14, 16, 18 B) 5, 10, 20, 40, 80, 160

C) 0, 2, 10, 12, 14, 16 D) 10, 20, 40, 80, 160, 320

16) Write the explicit formula for the following sequence

$\frac{2}{5}, \frac{4}{9}, \frac{6}{13}, \frac{8}{17}, \ldots$

Find the sum of the first n terms of the sequence.

17) 24, 28, 32, 36, . . . ; n = 9

A) 378 B) 360 C) 420 D) 252

18) 7, -1, -9, -17, . . . ; n = 9

A) - 225 B) - 290 C) - 261 D) $-\frac{513}{2}$

19) 10, 12, 14, 16, . . . ; n = 8

A) 136 B) 96 C) 162 D) 144

Write out the first five terms of the sequence. Assume n = 1

20) $a_n = n - 6$

A) -6, -5, -4, -3, -2 B) -5, -4, -3, -2, -1 C) -24, -18, -12, -6, 0 D) 1, 2, 3, 4, 5

21) $c_n = \frac{n+2}{n}$

A) $3, 2, \frac{5}{3}, \frac{3}{2}, \frac{7}{5}$ B) 1, 1, 1, 1, 1 C) $\frac{10}{8}, \frac{11}{9}, \frac{12}{10}, \frac{13}{11}, \frac{14}{12}$ D) $\frac{2}{8}, \frac{2}{9}, \frac{2}{10}, \frac{2}{11}, \frac{2}{12}$

Find an explicit rule for the nth term of the arithmetic sequence.

22) $a_{17} = -97, a_{19} = -283$

23) 19, 27, 35, 43, ...

A) $a_n = 19 - 8(n-1)$ B) $a_n = 19 - 8(n)$ C) $a_n = 19 + 8(n-1)$ D) $a_n = 19 + 8(n)$

Find the sum of the partial geometric series.

24) $3 + \frac{3}{2} + \frac{3}{4} + \frac{3}{8} + \frac{3}{16}$

A) 93 B) $\frac{93}{16}$ C) $\frac{3}{4}$ D) $\frac{3}{16}$

25) $1 + -3 + 9 + -27 + 81$

A) -61 B) -121 C) 61 D) 121

26) Write the first 5 terms of the sequence. Assume n =1

$a_n = \frac{5n}{(2n-1)!}$