Chapter 10 Practice Test

Name_____

Find the indicated sum. Use the formula for the sum of the first n terms of a geometric sequence.

1) $\sum_{i=1}^{5} 3(-4)^i$ 1) _____

Use the formula for the general term (the nth term) of a geometric sequence to find the indicated term of the sequence with the given first term, a_1, and common ratio, r.

2) Find a_6 when $a_1 = 3200$, $r = -\frac{1}{2}$. 2) _____

Find the indicated sum.

3) Find the sum of the first 70 terms of the arithmetic sequence: –19, –13, –7, –1, . . . 3) _____

4) $\sum_{i=3}^{5} (i^2 + 12)$ 4) _____

Write the first four terms of the sequence whose general term is given.

5) $a_n = \frac{n+1}{2n-1}$ 5) _____

6) $a_n = \frac{-4(n+1)!}{n!}$ 6) _____

Find the common difference for the arithmetic sequence.

7) –10, –14, –18, –22, . . . 7) _____

The general term of a sequence is given. Determine whether the given sequence is arithmetic, geometric, or neither. If the sequence is arithmetic, find the common difference; if it is geometric, find the common ratio.

8) $a_n = 3n - 5$ 8) _____

9) $a_n = \left(\frac{5}{4}\right)^n$ 9) _____

10) $a_n = 4n^2 - 2$ 10) _____

Solve the problem. Round to the nearest dollar if needed.

11) Kurt deposits $100 each month into an account paying annual interest of 6% compounded monthly. How much will his account have in it at the end of 11 years? 11) _____

Write a formula for the general term (the nth term) of the arithmetic sequence. Then use the formula for a_n to find a_{20}, the 20th term of the sequence.

12) 22, 14 , 6, –2, . . . 12) _____

13) Find the accumulated value of an investment of $11,000 at 8% compounded semiannually for 5 years. 13) _____

14) Jacob wants to buy a house for $350,000. Annual interest rates are locked in at 7.25% on a 30–year loan. How much money will Jacob pay in interest for his house? 14) _____

Use the formula for the general term (the nth term) of an arithmetic sequence to find the indicated term of the sequence with the given first term, a_1, and common difference, d.

15) Find a_{57} when $a_1 = -8$, $d = \frac{5}{8}$. 15) _____

Find the sum of the infinite geometric series, if it exists.

16) $\frac{1}{6} - \frac{1}{3} + \frac{2}{3} - \ldots$ 16) _____

17) $45 + 15 + 5 + \frac{5}{3} + \ldots$ 17) _____

Evaluate the factorial expression.

18) $\frac{n(n+4)!}{(n+5)!}$ 18) _____

19) Find the accumulated value of an investment of $3000 at 7% compounded continuously for 3 years. 19) _____

Express the sum using summation notation. Use 1 as the lower limit of summation and i for the index of summation.

20) $2 + 4 + 6 + \ldots + 12$ 20) _____

Write a formula for the general term (the nth term) of the geometric sequence.

21) $3, -1, \frac{1}{3}, -\frac{1}{9}, \frac{1}{27}, \ldots$ 21) _____

Solve the problem.

22) A deposit of $9000 is made in an account that earns 7% interest compounded quarterly. The balance in the account after n quarters is given by the sequence 22) _____

$$a_n = 9000\left(1 + \frac{0.07}{4}\right)^n \qquad n = 1, 2, 3, \ldots$$

Find the balance in the account after 7 years.

Express the repeating decimal as a fraction in lowest terms.

23) $0.\overline{387}$ 23) _____

Use the formula for the sum of the first n terms of a geometric sequence to solve.

24) Find the sum of the first 9 terms of the geometric sequence: –7, –14, –28, –56, –112, ... 24) _____

Use the formula for the sum of the first n terms of an arithmetic sequence to find the indicated sum.

25) $\sum_{i=1}^{46} (-2i + 2)$ 25) _____

If the given sequence is a geometric sequence, find the common ratio.

26) $\frac{3}{4}, \frac{3}{8}, \frac{3}{16}, \frac{3}{32}, \frac{3}{64}$ 26) _____

Express the sum using summation notation. Use a lower limit of summation not necessarily 1 and k for the index of summation.

27) 8 + 9 + 10 + 11 + . . . + 30 27) _____

Write the first five terms of the geometric sequence.

28) $a_n = -6a_{n-1}$; $a_1 = -5$ 28) _____

Write the first five terms of the arithmetic sequence.

29) $a_n = a_{n-1} - 1$; $a_1 = 2$ 29) _____

Write the first four terms of the sequence defined by the recursion formula.

30) $a_1 = -2$ and $a_n = -2a_{n-1}$ for $n \geq 2$ 30) _____

Solve the problem.

31) John Forgetsalot deposited $100 at a 3% annual interest rate in a savings account fifty years ago, and then he promptly forgot he had done it. Recently, he was cleaning out his home office and discovered the forgotten bank book. How much money is in the account? 31) _____

32) Carla has just inherited a building that is worth $250,000. The building is in a high demand area, and the value of the building is projected to increase at a rate of 25% per year for the next 4 years. How much more money will she make if she waits four years to sell the building instead of selling now? 32) _____

33) How much money needs to be invested now to get $2000 after 4 years at 8% compounded quarterly? Express your answer to the nearest dollar. 33) _____

34) If Emery has $2100 to invest at 10% per year compounded monthly, how long will it be before he has $2800? If the compounding is continuous, how long will it be? (Round your answers to three decimal places.) 34) _____

35) Cindy will require $15,000 in 5 years to return to college to get an MBA degree. How much money should she ask her parents for now so that, if she invests it at11% compounded continuously, she will have enough for school? (Round your answer to the nearest dollar.) 35) _____