DIRECTIONS: For each geometric series, find the sum. If the series has no sum, say so.

1. $24 + 12 + 6 + 3 + \cdots$

48

2. $24 - 12 + 6 - 3 + \cdots$

16

3. $27 - 18 + 12 - 8 + \cdots$

$16\frac{1}{5}$ or 16.2

4. $27 + 18 + 12 + 8 + \cdots$

81

5. $256 + 320 + 400 + 500 + \cdots$

No sum

6. $500 + 400 + 320 + 256 + \cdots$

2500

7. $3 + 4 + 5\frac{1}{3} + 7\frac{1}{9} + \cdots$

No sum

8. $\frac{1}{2} - \frac{1}{3} + \frac{2}{9} - \frac{4}{27} + \cdots$

$\frac{3}{10}$ or 0.3

9. $\sum_{n=0}^{\infty} 3\left(\frac{1}{4}\right)^n$

4

10. $\sum_{n=1}^{\infty} \frac{2^n}{5^n}$

$\frac{2}{3}$

DIRECTIONS: Solve. Determine if the problem describes an arithmetic, finite geometric, or infinite geometric series.

11. Every hour a clock chimes as many times as the hour. How many times does it chime from 1 A.M. to midnight, inclusive?

The clock chimes 156 times (78 • 2)   [Arithmetic]

12. The front row of a theater has 25 seats. Each of the rows behind it has two more seats than the row before it. How many total seats are there in the first 20 rows?

880 seats   [Arithmetic]

13. You have won contest sponsored by a local radio station. If you are given the choice of the two payment plans listed below, which plan will pay you more? How much more?
   A) $1 on the first day, $2 on the second day, $3 on the third day, etc., for two weeks.
   B) $0.01 on the first day, $0.02 on the second day, $0.04 on the third day, etc. for two weeks.

   Plan A - $105.00   Plan B - $163.83   Plan B is $58.83 better than Plan A
   [Arithmetic]   [Finite Geometric]

14. The 1560 members of the Great Pumpkin Society have a method of quickly notifying members. The president and treasurer each contact three members (round 1), each of whom contact three more members (round 2), each of whom contacts three more members (round 3), etc. How many rounds of contacts are needed before everyone in the organization is notified?

   6 rounds   [Finite Geometric – need to use logarithms to solve this problem]

15. A child on a swing is given a big push. She travels 12 feet on the first back-and-forth swing but only $\frac{5}{6}$ as far on each successive back-and-forth swing. How far (total distance) does she travel before the swing stops?

   72 feet   [Infinite Geometric]

16. A side of a square is 12 cm. The midpoints of its sides are joined to form an inscribed square, and this process is continued. Find the sum of the perimeters of the squares if this process is continued without end (round answer to two decimal places).

   163.88 cm   (Exactly $96 + 48\sqrt{2}$)   [Infinite Geometric]

17. A ball is thrown 12 meters in the air (so that the initial up-and-down distance is 24 meters). The ball rebounds 95% of the distance it falls. What is the total vertical distance traveled by the ball before it stops bouncing?

   480 meters   [Infinite Geometric]