Practice

Evaluate each finite series for the specified number of terms.

1. $40 + 20 + 10 + \ldots$; $n = 10$

3. $15 + 12 + 9.6 + \ldots$; $n = 40$

5. $0.2 + 0.02 + 0.002 + \ldots$; $n = 8$

7. This month, your friend deposits $400 to save for a vacation. She plans to deposit 10% more each successive month for the next 11 months. How much will she have saved after the 12 deposits?

Determine whether each infinite geometric series *diverges* or *converges*. State whether each series has a sum.

9. $4 + 2 + 1 + \ldots$

11. $6 + 11.4 + 21.66 + \ldots$ **13.** $50 + 70 + 98 + \ldots$

Evaluate each infinite geometric series.

15. $1 + \dfrac{1}{3} + \dfrac{1}{9} + \dfrac{1}{27} + \cdots$

17. $1000 + 750 + 562.5 + 421.875 + \ldots$

19. The end of a pendulum travels 50 cm on its first swing. Each swing after the first, it travels 99% as far as the preceding swing. How far will the pendulum travel before it stops?

21. The first year a toy manufacturer introduces a new toy, its sales total $495,000. The company expects its sales to drop 10% each succeeding year. Find the total expected sales in the first 6 years. Find the total expected sales if the company offers the toy for sale for as long as anyone buys it.

Determine whether each series is *arithmetic* or *geometric*. Then evaluate the series for the specified number of terms.

22. $2 + 5 + 8 + 11 + \dots; n = 9$

24. $-3 + 6 - 12 + 24 - \dots; n = 10$

26. $4 + 8 + 16 + 32 + \dots; n = 15$

Evaluate each infinite series that has a sum.

29. $\displaystyle\sum_{n=1}^{\infty}(-2.1)^{n-1}$

31. $\displaystyle\sum_{n=1}^{\infty}2\left(\frac{5}{3}\right)^{n-1}$

Find the specified value for each infinite geometric series.

33. $a_1 = 5$, $S = \dfrac{25}{3}$, find r

35. $a_1 = 3$, $S = 12$, find r

37. Error Analysis Your friend says that an infinite geometric series cannot have a sum because it's infinite. You say that it is possible for an infinite geometric series to have a sum. Who is correct? Explain.