STEWART 8.2

11–28 ■ Determine whether the series is convergent or divergent. If it is convergent, find its sum.

11. $5 - \frac{10}{3} + \frac{20}{9} - \frac{40}{27} + \cdots$

12. $1 + 0.4 + 0.16 + 0.064 + \cdots$

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

14. $\sum_{n=1}^{\infty} \frac{(-6)^{n-1}}{5^{n-1}}$

15. $\sum_{n=1}^{\infty} 3^{-n}8^{n+1}$

16. $\sum_{n=1}^{\infty} \frac{1}{e^{2n}}$

17. $\sum_{n=1}^{\infty} \frac{n}{n+5}$

18. $\sum_{n=1}^{\infty} \frac{3}{n}$

19. $\sum_{n=1}^{\infty} \frac{1}{n(n+2)}$

20. $\sum_{n=1}^{\infty} \frac{(n+1)^2}{n(n+2)}$

21. $\sum_{n=1}^{\infty} [2(0.1)^n + (0.2)^n]$

22. $\sum_{n=1}^{\infty} \frac{2}{n^2 + 4n + 3}$

23. $\sum_{n=1}^{\infty} \left[\sin\left(\frac{1}{n}\right) - \sin\left(\frac{1}{n+1}\right)\right]$

24. $\sum_{n=1}^{\infty} \left(\frac{1}{2^{n-1}} + \frac{2}{3^{n-1}}\right)$

25. $\sum_{n=1}^{\infty} \frac{3^n + 2^n}{6^n}$

26. $\sum_{n=1}^{\infty} \frac{1}{5 + 2^{-n}}$

27. $\sum_{n=1}^{\infty} \arctan n$

28. $\sum_{n=1}^{\infty} \ln \frac{n}{n+1}$

29–32 ■ Express the number as a ratio of integers.

29. $0.\overline{2} = 0.2222\ldots$

30. $0.\overline{73} = 0.73737373\ldots$

31. $3.\overline{417} = 3.417417417\ldots$

32. $6.2\overline{54} = 6.2545454\ldots$

33–36 ■ Find the values of x for which the series converges. Find the sum of the series for those values of x.

33. $\sum_{n=1}^{\infty} \frac{x^n}{3^n}$

34. $\sum_{n=0}^{\infty} 2^n(x+1)^n$

35. $\sum_{n=0}^{\infty} \frac{1}{x^n}$

36. $\sum_{n=0}^{\infty} \tan^n x$