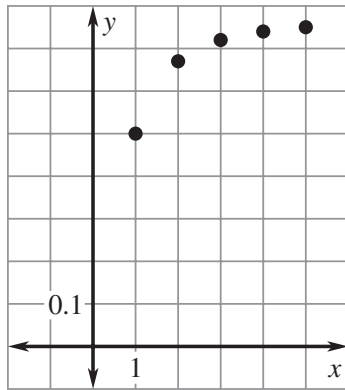


# Answers for 12.4

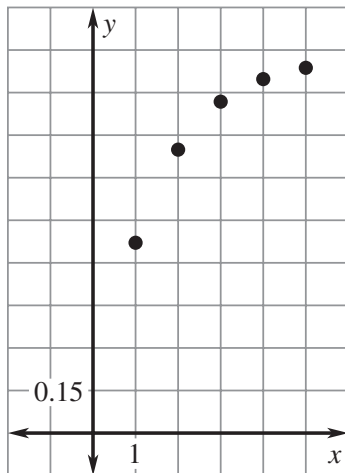
For use with pages 823–825

## 12.4 Skill Practice

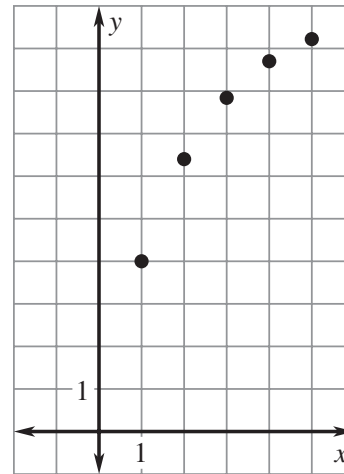
- partial sum
- If  $|r| < 1$ , then the series has a sum.
- $S_1 = 0.5, S_2 \approx 0.67, S_3 \approx 0.72, S_4 \approx 0.74, S_5 \approx 0.75$ ;  $S_n$  appears to be approaching 0.75.



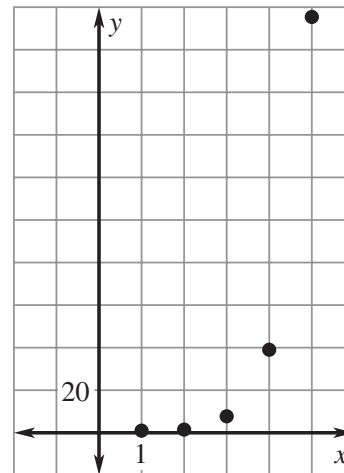
- $S_1 = 0.67, S_2 = 1, S_3 \approx 1.17, S_4 = 1.25, S_5 \approx 1.29$ ;  $S_n$  appears to be approaching 1.3.



- $S_1 = 4, S_2 = 6.4, S_3 = 7.84, S_4 \approx 8.71, S_5 \approx 9.22$ ;  $S_n$  appears to be approaching 10.



- $S_1 = 0.25, S_2 = 1.5, S_3 = 7.75, S_4 = 39, S_5 = 195.25$ ;  $S_n$  continues to increase.



- 10
- no sum
- no sum
- $\frac{88}{15}$
- $\frac{12}{5}$
- $-\frac{25}{3}$
- $\frac{63}{17}$
- no sum

## Answers for 12.4 *continued*

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15. no sum      16.  $-\frac{8}{5}$

17.  $\frac{7}{10}$       18. no sum

19. Since  $r > 1$ , the infinite geometric series has no sum.

20.  $-\frac{3}{8}$       21.  $\frac{1}{2}$

22. no sum      23. 18

24.  $\frac{2}{9}$       25.  $\frac{4}{9}$

26.  $\frac{16}{99}$       27.  $\frac{625}{999}$

28.  $\frac{3200}{99}$       29.  $\frac{130,000}{999}$

30.  $\frac{1}{11}$       31.  $\frac{5}{18}$

32. C

33.  $\frac{0.9}{1 - 0.1} = \frac{0.9}{0.9} = 1$

34. Sample answer:  $\sum_{i=1}^{\infty} 2.5\left(\frac{1}{2}\right)^{i-1}$ ,  
 $\sum_{i=1}^{\infty} \frac{10}{3}\left(\frac{1}{3}\right)^{i-1}$

35.  $x < \frac{1}{4}$ ;  $S = \frac{1}{1 - 4x}$

36.  $x < 4$ ;  $S = \frac{6}{1 - \frac{1}{4}x}$

### 12.4 Problem Solving

37. 70 ft

38. \$2,916,666.67;  $s = \frac{350,000}{1 - 0.88}$

39. D

40.  $S_d = 40$  ft,  $S_t = 2$  sec; Yes; the total distance traveled is 40 feet and it occurs after 2 seconds.

41. a. 12 ft; 9 ft

b.  $\sum_{i=1}^{\infty} 12(0.75)^{i-1}$

c. 56 ft

d.  $\frac{2(0.75h)}{1 - 0.75} + h = 7h$

42. a.  $a_n = \frac{3^{n-1}}{4n}$

b. 1; eventually no area remains

### 12.4 Mixed Review

43. 61%      44. 0.46      45. 0.1

46.  $a_n = -3 + 5n$

47.  $a_n = -35 + 8n$

48.  $a_n = 216 - 18n$

49.  $a_n = 41 - 7n$

50.  $a_n = 59.5 + 6.5n$

51.  $a_n = 17.5 - 1.5n$

52.  $a_n = 4(2.5)^{n-1}$

53.  $a_n = 6(-3)^{n-1}$

54.  $a_n = 10,368\left(-\frac{1}{4}\right)^{n-1}$

## Answers for 12.4 *continued*

*For use with pages 823–825*

$$55. a_n = \frac{1}{9}(6)^{n-1}$$

$$56. a_n = \frac{10,240}{81}(0.75)^{n-1}$$

$$57. a_n = 2(4)^{n-1}$$