

ANSWERS

1. $6(1) - 5, 6(2) - 5, 6(3) - 5,$
 $6(4) - 5; 6(5) - 5 = 25,$
 $a_n = 6n - 5$

2. $-1 \cdot 5(1), 1 \cdot 5(2), -1 \cdot 5(3),$
 $1 \cdot 5(4); -1 \cdot 5(5) = -25;$
 $a_n = (-1)^n \cdot 5n$

3.
$$\frac{1}{10 + 10^3} \cdot \frac{2}{10(2) + 10^3}$$

$$\frac{3}{10(3) + 10^3} \cdot \frac{4}{10(4) + 10^3}$$

$$\frac{5}{10(5) + 10^3} = \frac{5}{60} = \frac{1}{12};$$

$$a_n = \frac{n}{10n + 10}$$

4. $\sum_{i=1}^{15} i = 120$

5. $\sum_{i=1}^8 \frac{i-1}{i} = \frac{1479}{280}$

6. $\sum_{i=3}^{10} i^2 = 380$

7. $a_n = \frac{1}{4}n$

8. $a_n = \frac{1}{2}(2)^n - 1$

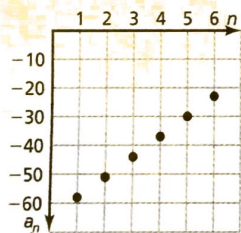
9. $a_n = -2n + 3$

10. arithmetic; $a_n = -7n + 20; -43$

11. neither; $a_n = \frac{1}{n+1}, \frac{1}{10}$

12. geometric; $a_n = (-3)^{n-1}; 6561$

13. $a_n = 7n - 65$



14. $a_n = -\frac{2}{125}(5)^{n-1}$

15. 180

16. $-223\frac{2}{3}$

17. $-\frac{4095}{8192}$

18. 105 pieces of chalk

8.1–8.3 Quiz

Describe the pattern, write the next term, and write a rule for the n th term of the sequence. (Section 8.1)

1. 1, 7, 13, 19, ...

2. -5, 10, -15, 20, ...

3. $\frac{1}{20}, \frac{2}{30}, \frac{3}{40}, \dots$

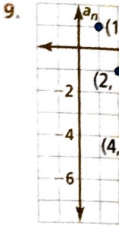
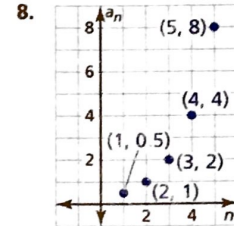
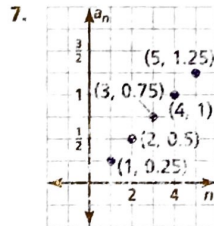
Write the series using summation notation. Then find the sum of the series. (Section 8.1)

4. $1 + 2 + 3 + 4 + \dots + 15$

5. $0 + \frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \dots + \frac{7}{8}$

6. $9 + 16 + 25 + \dots$

Write a rule for the n th term of the sequence. (Sections 8.2 and 8.3)



Tell whether the sequence is arithmetic, geometric, or neither. Write a rule for the n th term of the sequence. Then find a_9 . (Sections 8.2 and 8.3)

10. 13, 6, -1, -8, ...

11. $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \dots$

12. 1, -3, 9, -27, ...

13. One term of an arithmetic sequence is $a_{12} = 19$. The common difference is $d = 7$. Write a rule for the n th term. Then graph the first six terms of the sequence. (Section 8.2)

14. Two terms of a geometric sequence are $a_6 = -50$ and $a_9 = -6250$. Write a rule for the n th term. (Section 8.3)

Find the sum. (Sections 8.2 and 8.3)

15. $\sum_{n=1}^9 (3n + 5)$

16. $\sum_{k=1}^5 11(-3)^{k-2}$

17. $\sum_{i=1}^{12} -4\left(\frac{1}{2}\right)^{i-1}$

18. Pieces of chalk are stacked in a pile. Part of the pile is shown. The bottom row has 15 pieces of chalk, and the top row has 6 pieces of chalk. Each row has one less piece of chalk than the row below it. How many pieces of chalk are in the pile? (Section 8.2)



19. You accept a job as an environmental engineer that pays a salary of \$45,000 in the first year. After the first year, your salary increases by 3.5% per year. (Section 8.3)

a. Write a rule giving your salary a_n for your n th year of employment.

b. What will your salary be during your fifth year of employment?

c. You work 10 years for the company. What are your total earnings? Justify your answer.

19. a. $a_n = 45,000(1.035)^{n-1}$

b. \$51,638.54

c. $\sum_{i=1}^{10} 45,000(1.035)^{i-1} = \$527,912.69$