

1. Find the common difference and the 100th term of the following arithmetic sequence.

1.3, 2.8, 4.3, 5.8, ...

2. The 12th term of an arithmetic sequence is 32, and the fifth term is 18. Find the 20th term.

3. Find the common ratio and the n th term of the following geometric sequence.

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

4. Find the sum: $-3 + \left(-\frac{3}{2}\right) + 0 + \frac{3}{2} + 3 + \cdots + 30$ (Is this an arithmetic or a geometric sequence?)

5. Determine whether the infinite geometric series converges or diverges. If it converges, find its sum.

$$\frac{3}{5} + \frac{6}{25} + \frac{12}{125} + \cdots$$

Q: Which is correct to say? The yolk of the egg *are* white, or the yolk of the egg *is* white?

6. Find the common difference and the 100th term of the following arithmetic sequence.
9, 2, -5, -12, ...

7. Find the common difference and the 100th term of the following arithmetic sequence.

$$3, \frac{11}{2}, 8, \frac{21}{2}, \dots$$

8. Find the common ratio and the n th term of the following geometric sequence.

$$10, -5, \frac{5}{2}, -\frac{5}{4}, \dots$$

9. Find the common ratio and the n th term of the following geometric sequence.

$$\frac{3}{5}, \frac{4}{5}, \frac{16}{15}, \frac{64}{45}, \dots$$

Note: For the next 4 exercises, first ask yourself: “Is this an arithmetic or geometric sequence?” Remember that if you’re always adding/subtracting by the same number, it’s arithmetic. If you’re always multiplying/dividing by the same number, it’s geometric.

10. Find the sum: $-7 + (-3) + 1 + 5 + \dots + 89$

11. Find the sum: $4 + 6 + 9 + \frac{27}{2} + \dots + \frac{59049}{256}$

12. Find the sum: $\frac{3}{5} - \frac{2}{5} + \frac{4}{15} - \frac{8}{45} + \dots + \frac{256}{10935}$

13. Find the sum: $\frac{5}{2} + \frac{13}{6} + \frac{11}{6} + \frac{3}{2} + \dots - \frac{25}{6}$

14. Determine whether the infinite geometric series converges or diverges. If it converges, find its sum.

$$2 - \frac{3}{2} + \frac{9}{8} - \frac{27}{32} + \dots$$

15. Determine whether the infinite geometric series converges or diverges. If it converges, find its sum.

$$50 + 20 + 8 + \frac{16}{5} + \dots$$

16. Determine whether the infinite geometric series converges or diverges. If it converges, find its sum.

$$8 - 10 + \frac{25}{2} - \frac{125}{8} + \dots$$

17. Determine whether the infinite geometric series converges or diverges. If it converges, find its sum.

$$5 + (-5) + 5 + (-5) + \dots$$

Optional exercises from the Sullivan book if you'd like more practice:
12.2 (p.814) #25-49 odd
12.3 (p.824) #27-35, 41-45 odd, 53-59 odd