

# C9L1 Notes

## Arithmetic Sequences

Find the missing number(s) of the arithmetic sequence.

1. 51, 47, 43, 39, 35, 31

THE NUMBERS ARE DECREASING  
BY FOUR EACH TIME

2. 4.2, 4.7, 5.2, 5.7, 6.2, 6.7

THE NUMBERS ARE INCREASING  
BY 0.5 EACH TIME

State the next fraction in the sequence. Simplify if possible.

3.  $\frac{1}{2}, \frac{3}{5}, \frac{7}{10}, \frac{4}{5}, \dots$   $\left(\frac{9}{10}\right)$

$\frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}$

4.  $\frac{9}{20}, \frac{2}{5}, \frac{7}{20}, \frac{3}{10}, \dots$   $\left(\frac{1}{4}\right)$

$\frac{9}{20}, \frac{8}{20}, \frac{7}{20}, \frac{6}{20}, \frac{5}{20}$

5.  $\frac{1}{5}, \frac{1}{3}, \frac{7}{15}, \frac{3}{5}, \dots$   $\left(\frac{11}{15}\right)$

$\frac{3}{15}, \frac{5}{15}, \frac{7}{15}, \frac{9}{15}, \frac{11}{15}$

6.  $\frac{19}{21}, \frac{37}{42}, \frac{6}{7}, \frac{5}{6}, \dots$   $\left(\frac{17}{21}\right)$

$\frac{38}{42}, \frac{37}{42}, \frac{36}{42}, \frac{35}{42}, \frac{34}{42}$

**Formula for an arithmetic sequence:  $a_n = a_1 + (n - 1)(d)$**

**$a_n$  = value of the nth term**

**$a_1$  = initial term**

**$n$  = numbered position of the term in the sequence**

**$d$  = common difference**

**Write an expression to describe the sequence below. Use  $n$  to represent the position of a term in the sequence, where  $n = 1$  for the first term.**

**7. 6, 15, 24, 33, ...**

$$6 + (n-1)(9)$$

**8. 7, 11, 15, 19, ...**

$$7 + (n-1)(4)$$

**9. -41, -39, -37, -35, ...**

$$-41 + (n-1)(2)$$

**10. -9, -18, -27, -36, ...**

$$-9 + (n-1)(-9)$$

**11. Write an expression to describe the sequence below, and then find the 8th term. Use  $n$  to represent the position of a term in the sequence, where  $n = 1$  for the first term.**

**18, 19, 20, 21, ...**

$$\text{EXP: } 18 + (n-1)(1)$$

$$8^{\text{th}}: 18 + (8-1)(1)$$

$25$

12. Write an expression to describe the sequence below, and then find the 59th term. Use  $n$  to represent the position of a term in the sequence, where  $n = 1$  for the first term.

-32, -35, -38, -41, ...

$$\text{EXP: } -32 + (n-1)(-3)$$

$$\begin{aligned} 59^{\text{th}} &: -32 + (59-1)(-3) \\ & \quad -206 \end{aligned}$$

13. Write an expression to describe the sequence below, and then find the 98th term. Use  $n$  to represent the position of a term in the sequence, where  $n = 1$  for the first term.

-63, -126, -189, -252, ...

$$\text{EXP: } -63 + (n-1)(-63)$$

$$\begin{aligned} 98^{\text{th}} &: -63 + (98-1)(-63) \\ & \quad -6174 \end{aligned}$$

14. Write an expression to describe the sequence below, and then find the 27th term. Use  $n$  to represent the position of a term in the sequence, where  $n = 1$  for the first term.

3, 6, 9, 12, ...

$$\text{EXP: } 3 + (n-1)(3)$$

$$\begin{aligned} 27^{\text{th}} &: 3 + (27-1)(3) \\ & \quad 81 \end{aligned}$$

15. Find the 11th term of the arithmetic sequence represented by the equation:  $a_n = 12 + (n - 1)(5)$

$$a_{11} = 12 + (11-1)(5)$$

$$a_{11} = 62$$

16. Find the common difference of the arithmetic sequence represented by the equation:  $a_n = 42 + (n - 1)(-3)$

$$d = -3$$

17. Find the common difference of the arithmetic sequence:  
8, 15, 22, 29, ...

$$d = 7$$

18. Find the 85th term of the arithmetic sequence:  
-4, -21, -38, -55, ...

$$a_n = -4 + (n-1)(-17)$$

$$a_{85} = -4 + (85-1)(-17)$$

$$a_{85} = -1432$$