

Learning Goals:

- I can convert a sequence into a recursive or explicit formula.
- I can use a formula to find missing terms in a sequence.
- I can determine the common difference from a sequence.

Write out the first three terms of the following arithmetic sequences; then write an explicit and recursive formula.

	Explicit	Recursive
1. $a_1 = 6, d = 12$ <u>6</u> , <u>18</u> , <u>30</u>	$a_n = 6 + (n-1)12$ or $a_n = 6 + 12(n-1)$	$\begin{cases} a_1 = 6 \\ a_n = a_{n-1} + 12 \end{cases}$
2. $a_1 = 3, d = -2.5$ <u>3</u> , <u>0.5</u> , <u>-2</u>	$a_n = 3 + (n-1)(-2.5)$ or $a_n = 3 - 2.5(n-1)$	$\begin{cases} a_1 = 3 \\ a_n = a_{n-1} - 2.5 \end{cases}$
3. $a_1 = -54, d = -12$ <u>-54</u> , <u>-66</u> , <u>-78</u>	$a_n = -54 + (n-1)(-12)$	$\begin{cases} a_1 = -54 \\ a_n = a_{n-1} - 12 \end{cases}$
4. $a_1 = -2.7, d = 1.2$ <u>-2.7</u> , <u>-1.5</u> , <u>-0.3</u>	$a_n = -2.7 + (n-1)1.2$	$\begin{cases} a_1 = -2.7 \\ a_n = a_{n-1} + 1.2 \end{cases}$
5. $a_1 = \frac{4}{5}, d = -4$ <u>$\frac{4}{5}$</u> , <u>$-\frac{16}{5}$</u> , <u>$-\frac{36}{5}$</u> <u>0.8</u> , <u>-3.2</u> , <u>-7.2</u>	$a_n = \frac{4}{5} + (n-1)(-4)$	$\begin{cases} a_1 = \frac{4}{5} \\ a_n = a_{n-1} - 4 \end{cases}$

Find the indicated term in each arithmetic sequence:

6. a_5 for -12, -13, -14, ...

$$\begin{aligned} & \checkmark \\ & -1 \\ a_5 &= -12 + (5-1)(-1) \\ a_5 &= -12 - 4 \\ \boxed{a_5} &= \boxed{-16} \end{aligned}$$

7. a_{80} for 20, 17, 14, ...

$$\begin{aligned} & \checkmark \\ & -3 \\ a_{80} &= 20 + (80-1)(-3) \\ a_{80} &= 20 - 237 \\ \boxed{a_{80}} &= \boxed{-217} \end{aligned}$$

8. a_{12} for 2.5, 8.5, 14.5, ...

$$\begin{aligned} & \checkmark \\ & 6 \\ a_{12} &= 2.5 + (12-1)6 \\ a_{12} &= 2.5 + 66 \\ \boxed{a_{12}} &= \boxed{68.5} \end{aligned}$$

9. a_{33} for 4.21, 10.62, 17.03, 23.44, ...

$$\begin{aligned} & \checkmark \\ & 6.41 \\ a_{33} &= 4.21 + (32)(6.41) \\ a_{33} &= 4.21 + 205.12 \\ a_{33} &= 209.33 \end{aligned}$$

Find the first three terms of the following sequences.

10. $\begin{cases} w_1 = 64 \\ w_n = w_{n-1} - \frac{3}{2} \end{cases}$ 64, 62.5, 61

11. $r_n = -71 + (n-1)(-3)$ -71, -74, -77
 $\downarrow \quad \downarrow$
 $r_1 \quad r_1 + d \quad r_1 + 2d \text{ or } r_2 + d$