

## Notes

Period      6.2 Arithmetic sequences in recursive form.

Write a recursive formula for each arithmetic

sequence below. What is the value of the sixth term?

1)  $1, 5, 9, 13$

$$\frac{17}{21}$$

$A_n = A_1 + (n-1)d$  explicit formula

$A(n) = A(n-1) + d$  recursive formula.

$$A(n) = A(n-1) + d$$

$$A(n) = A(n-1) + 4$$

$$A(6) = A(6-1) + 4$$

$$A(6) = A(5) + 4$$

$$A(6) = 17 + 4$$

$$A(6) = 21$$

2)  $9, 15, 21, 27$   $\frac{33}{33}$

$$A(n) = A(n-1) + 6$$

$$A(6) = A(6-1) + 6$$

$$A(6) = A(5) + 6$$

$$A(6) = 33 + 6$$

$$A(6) = 39$$

$$\begin{array}{r}
 A_1 \quad A_2 \quad A_3 \quad A_4 \quad A_5 \\
 1.5, \quad 2.25, \quad 3, \quad 3.75, \quad \underline{4.5} \\
 \begin{array}{l}
 \text{+0.75} \\
 \text{+0.75} \\
 \text{+0.75}
 \end{array}
 \end{array}$$

$$A(n) = A(n-1) + d$$

$$A(n) = A(n-1) + 0.75$$

$$A(6) = A(6-1) + 0.75$$

$$A(6) = A(5) + 0.75$$

$$A(6) = 4.5 + 0.75$$

$$A(6) = 5.25$$

$$\begin{array}{r}
 9.9, \quad 8.8, \quad 7.7, \quad 6.6, \quad \underline{5.5} \\
 \begin{array}{l}
 \text{-1.1} \\
 \text{-1.1} \\
 \text{-1.1} \\
 \text{-1.1}
 \end{array}
 \end{array}$$

$$A(n) = A(n-1) + d$$

$$A(n) = A(n-1) - 1.1$$

$$A(6) = A(6-1) - 1.1$$

$$A(6) = A(5) - 1.1$$

$$A(6) = 5.5 - 1.1$$

$$A(6) = 4.4$$

$$5) \quad 1.5, 5, 8.5, 12, \underline{15.5}$$

$$A(n) = A(n-1) + d$$

$$A(n) = A(n-1) + 3.5$$

$$A(6) = A(6-1) + 3.5$$

$$A(6) = A(5) + 3.5$$

$$A(6) = 15.5 + 3.5$$

$$A(6) = 19$$

$$6) \quad 11, 21, 31, 41, \underline{51}$$

$$A(n) = A(n-1) + d$$

$$A(n) = A(n-1) + 10$$

$$A(6) = A(6-1) + 10$$

$$A(6) = A(5) + 10$$

$$A(6) = 51 + 10$$

$$A(6) = 61$$

Use each recursive definition to find the first four terms of the arithmetic sequence.

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

$A(1) = 4$

$\underline{4}, \underline{8}, \underline{12}, \underline{16}$

8)  $A(n) = A(n-1) + 11$   $A(1) = 12$

$\underline{12} \xrightarrow{+11} \underline{23} \xrightarrow{+11} \underline{34} \xrightarrow{+11} \underline{45}$

9)  $A(n) = A(n-1) + 5$   $A(1) = -16$

$\underline{-16} \xrightarrow{+5} \underline{-11} \xrightarrow{+5} \underline{-6} \xrightarrow{+5} \underline{-1}$

10)  $A(n) = A(n-1) - 7$   $A(1) = -7$

$\underline{-7} \xrightarrow{-7} \underline{-14} \xrightarrow{-7} \underline{-21} \xrightarrow{-7} \underline{-28}$

11)  $A(n) = A(n-1) + \frac{1}{3}$   $A(1) = 0$

$\underline{0}, \underline{\frac{1}{3}}, \underline{\frac{2}{3}}, \underline{1}$

$$12) A(n) = A(n-1) + 5 \quad A(1) = 5$$

$$5 \quad \underline{10} \quad \underline{15} \quad \underline{20}$$

Write a recursive definition for each explicit formula.

$$13) A(n) = 4 + (n-1)(-5)$$

$$A(n) = A(n-1) + d$$

$$A(n) = A(n-1) + (-5) \quad A(1) = 4$$

$$14) A(n) = 2 + (n-1)(6)$$

$$A(n) = A(n-1) + d$$

$$A(n) = A(n-1) + 6 \quad A(1) = 2$$

$$15) A(n) = -5.5 + (n-1)(2)$$

$$A(n) = A(n-1) + d$$

$$A(n) = A(n-1) + 2 \quad A(1) = -5.5$$

$$16) A(n) = 3 + (n-1)(1.5)$$

$$A(n) = A(n-1) + d$$

$$A(n) = A(n-1) + (1.5) \quad A(1) = 3$$

$$17) A(n) = -2 + (n-1)(5)$$

$$A(n) = A(n-1) + d$$

$$A(n) = A(n-1) + (5) \quad A(1) = -2$$

$$18) A(n) = 1.4 + (n-1)(3)$$

$$A(n) = A(n-1) + d$$

$$A(n) = A(n-1) + (3) \quad A(1) = 1.4$$

19) Write an explicit formula for each recursive formula.

$$19) A(n) = A(n-1) - 0.8 \quad A(1) = 1.6$$

$$A(n) = A_1 + (n-1)d$$

$$A(n) = 1.6 + (n-1)(-0.8)$$

$$20) A(n) = A(n-1) + 8 \quad A(1) = 5$$

$$A(n) = A_1 + (n-1)d$$

$$A(n) = 5 + (n-1)(8)$$

$$21) A(n) = A(n-1) - 4 \quad A(1) = 51$$

$$A(n) = A_1 + (n-1)d$$

$$A(n) = 51 + (n-1)(-4)$$

$$22) \quad A(n) = A(n-1) + 0.3 \quad A(1) = 0.2$$

$$A(n) = A_1 + (n-1)d$$

$$A(n) = 0.2 + (n-1)(0.3)$$

$$23) \quad A(n) = A(n-1) + 8 \quad A(1) = 9$$

$$A(n) = A_1 + (n-1)d$$

$$A(n) = 9 + (n-1)(8)$$

$$24) \quad A(n) = A(n-1) + 2.5 \quad A(1) = 2.5$$

$$A(n) = A_1 + (n-1)d$$

$$A(n) = 2.5 + (n-1)(2.5)$$