

Name Kcy
8A; Algebra 1

Date _____
Period _____

Homework

For #1: Given the explicit formula for an arithmetic sequence find the first four terms and the term named in the problem.

1) $a_n = -11 + 7n$

Find a_{34}

$$\begin{aligned} n=1 \\ a_n &= -11 + 7n \\ a_1 &= -11 + 7(1) \\ a_1 &= -11 + 7 \\ \boxed{a_1 &= -4} \end{aligned}$$

$$\begin{aligned} n=2 \\ a_n &= -11 + 7n \\ a_2 &= -11 + 7(2) \\ a_2 &= -11 + 14 \\ \boxed{a_2 &= 3} \end{aligned}$$

$$\begin{aligned} n=3 \\ a_n &= -11 + 7n \\ a_3 &= -11 + 7(3) \\ a_3 &= -11 + 21 \\ \boxed{a_3 &= 10} \end{aligned}$$

$$\begin{aligned} n=4 \\ a_n &= -11 + 7n \\ a_4 &= -11 + 7(4) \\ a_4 &= -11 + 28 \\ \boxed{a_4 &= 17} \end{aligned}$$

$$\begin{aligned} n=34 \\ a_n &= -11 + 7n \\ a_{34} &= -11 + 7(34) \\ a_{34} &= -11 + 238 \\ \boxed{a_{34} &= 227} \end{aligned}$$

2) Write the 12th term of the sequence: $a_n = 3n - 2$

$$\begin{aligned} n=12 \\ a_n &= 3n - 2 \\ a_{12} &= 3(12) - 2 \\ a_{12} &= 36 - 2 \\ \boxed{a_{12} &= 34} \end{aligned}$$

3) Find the explicit formula and the indicated term for the arithmetic sequence
15th term: 2, 3.5, 5, 6.5, ...

~~Must~~ determine the explicit formula first!

$$\begin{aligned} a_1 &= 2 & a_n &= a_1 + d(n-1) \\ d &= 1.5 & a_n &= 2 + 1.5(n-1) \\ & & a_n &= 2 + 1.5n - 1.5 \\ & & \boxed{a_n &= 1.5n + 0.5} \end{aligned}$$

\uparrow \uparrow
 a/n a_0/b

$$\begin{aligned} n=15 \\ a_n &= 1.5n + 0.5 \\ a_{15} &= 1.5(15) + 0.5 \\ a_{15} &= 22.5 + 0.5 \\ \boxed{a_{15} &= 23} \end{aligned}$$

For #'s 4 & 5: Find the explicit formula and the term named in the problem:

4) 1, -5, -11, -17, ...

Find a_{38}

Must discover
the explicit formula
1st

$$a_1 = 1 \quad a_n = a_1 + d(n-1)$$

$$d = -6 \quad a_n = 1 - 6(n-1)$$

$$a_n = 1 - 6n + 6$$

$$a_n = -6n + 7$$

$\begin{matrix} d & a_1 \\ m & b \end{matrix}$

$n = 38$

$$a_n = -6n + 7$$

$$a_{38} = -6(38) + 7$$

$$a_{38} = -228 + 7$$

$$a_{38} = -221$$

5) 11, 14, 17, 20, ...

Find a_{27}

Must discover
the explicit formula
first

$$a_1 = 11 \quad a_n = a_1 + d(n-1)$$

$$d = 3 \quad a_n = 11 + 3(n-1)$$

$$a_n = 11 + 3n - 3$$

$$a_n = 3n + 8$$

$\begin{matrix} d & a_1 \\ \text{(slope)} & \text{(y-int)} \end{matrix}$

$n = 27$

$$a_n = 3n + 8$$

$$a_{27} = 3(27) + 8$$

$$a_{27} = 81 + 8$$

$$a_{27} = 89$$

For #6: Given the first term and the common difference of an arithmetic sequence, find the explicit formula and the first four terms.

6) $a_1 = -38, d = -100$

$$a_n = a_1 + d(n-1)$$

$$a_n = -38 - 100(n-1)$$

$$a_n = -38 - 100n + 100$$

$$a_n = -100n + 62$$

$n = 2$

$$a_n = -100n + 62$$

$$a_2 = -100(2) + 62$$

$$a_2 = -200 + 62$$

$$a_2 = -138$$

$n = 3$

$$a_n = -100n + 62$$

$$a_3 = -100(3) + 62$$

$$a_3 = -300 + 62$$

$$a_3 = -238$$

$n = 4$

$$a_n = -100n + 62$$

$$a_4 = -100(4) + 62$$

$$a_4 = -400 + 62$$

$$a_4 = -338$$

$a_1 = 24.95$

7) A movie rental club charges \$4.95 for the first month's rentals. The club charges \$18.95 for each additional month. How much is the total cost for one year?

$a_1 = 4.95$
 $d = 18.95$

1 year =
12 months so
 $n = 12$

$$a_n = a_1 + d(n-1)$$

$$a_n = 4.95 + 18.95(n-1)$$

$$a_n = 4.95 + 18.95n - 18.95$$

$$a_n = 18.95n - 14$$

$n = 12$

$$a_n = 18.95n - 14$$

$$a_{12} = 18.95(12) - 14$$

$$a_{12} = 227.4 - 14$$

$$a_{12} = 213.4$$

\$213.40

$$y = 18.95x + 4.95$$

$$y = 18.95(11) + 4.95$$

$$y = 208.45 + 4.95$$

$$y = 213.40$$

1st
month
so
 $x = 11$
not
12