

Applications Involving Arithmetic Sequences

Recall two ways to describe an arithmetic sequence:

Recursively:	$a_{n+1} = a_n + d$
Explicitly:	$a_n = a_1 + (n-1)d$

- The first term of an arithmetic sequence is 3 and $a_2 = a_1 + 6$. Find a_{24} .
- The third term of an arithmetic sequence is 22. The 19th term is 134. Find the 16th term.
- Insert 2 arithmetic means between 7 and 25.
- Insert 5 arithmetic means between -5 and 37.
- The new Second Avenue subway line will stop at regular intervals (i.e., the street numbers of each stop form an arithmetic sequence). The fourth stop is at 14th Street. The 20th stop is at 78th Street. Find the street number where the line makes its:
 - first stop
 - 31st stop (the end of the line)
- In an arithmetic sequence, $a_1 = x$ and $d = 3x$. Find a_{30} .
- In an arithmetic sequence, $a_3 = 38$ and $a_{11} = 14$. Find the first five terms of the sequence.
- Given the terms of each arithmetic sequence, find an explicit formula for a_n :
 - 3, 8, 13, 18, 23
 - 3, 6, 9, 12
 - $a_1 = 5$ and $a_4 = 15$