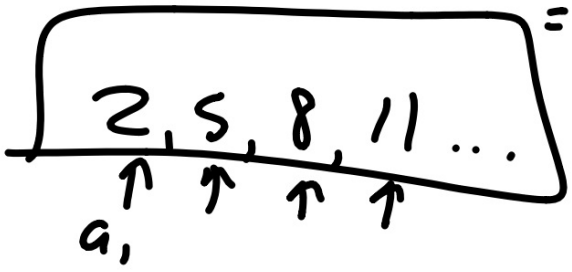
Precalc 12.1

*Algebra 1

Find the nth term and arithmetic means of a sequence
Find the sum of n terms of an arithmetic sequence

$a_{99} = a_1 + 98d$
$= 2 + 98 \cdot 3$
$= 296$

sequence* rule



arithmetic sequence* +

term $a_1 = 2$

common difference $d = 3$

12, 6, 0, −6 . . .
a_1

recursive formula start @ a_1, . . . $d = -6$

explicit formula jump to any

Arithmetic Sequence	An arithmetic sequence is a sequence in which each term after the first, a_1, is equal to the sum of the preceding term and the common difference, d. The terms of the sequence can be represented as follows. $a_1, a_1 + d, a_1 + 2d, \ldots$

a_1

$a_2 = a_1 + d$

$a_3 = \underbrace{\quad + d} = a_1 + 2d$

$a_4 = \underbrace{\qquad\qquad + d} = a_1 + 3d$

$a_5 = a_1 + 4d$

$a_6 = a_1 + 5d$

$\vdots$

$a_{10} = a_1 + 9d$

$\vdots$

$a_{52} = a_1 + 51d$

$\vdots$

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

1 Find the next four terms in the arithmetic sequence $-5, -2, 1, \ldots$

$d = 3$ 4, 7, 10, 13

first term	a_1
second term	a_2
third term	a_3
fourth term	a_4
fifth term	a_5
$\vdots$	$\vdots$
nth term	a_n

2 Find the 47th term in the arithmetic sequence $-4, -1, 2, 5, \ldots$.

$$a_{47} = a_1 + 46d$$
$$= -4 + 46(3)$$
$$= 134$$

3 Find the first term in the arithmetic sequence for which $a_{19} = 42$ and $d = -\frac{2}{3}$.

$$a_{19} = a_1 + 18 \cdot d$$

$$42 = a_1 + 18 \cdot -\frac{2}{3}$$

$$42 = a_1 - 12$$

$$+12 \qquad +12$$

$$54 = a_1$$

4 Write an arithmetic sequence that has five arithmetic means between 4.9 and 2.5.

$\frac{12+30}{2}$

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4.9 4.5 4.1 3.7 3.3 2.9 2.5

a_1 . . . . . a_7

$a_7 = a_1 + 6d$

$2.5 = 4.9 + 6d$

$-2.4 = 6d$

$d = -0.4$

Gauss



1777-1855

$1+2+3+4+5 \quad \ldots \quad 98, 99, 100$

$101 + 101 + 101$

$50(101)$

$= 5050$

Arithmetic Sequence

$-9, -3, 3, 9, 15$

$3, \frac{5}{2}, 2, \frac{3}{2}, 1, \frac{1}{2}$

$a_1, a_2, a_3, a_4, \ldots, a_n$

Arithmetic Series

$-9 + (-3) + 3 + 9 + 15$

$3 + \frac{5}{2} + 2 + \frac{3}{2} + 1 + \frac{1}{2}$

$a_1 + a_2 + a_3 + a_4 + \cdots + a_n$

$\frac{n}{2}(a_1 + a_n)$

World series...sum of 7 games

Sum of a Finite Arithmetic Series

The sum of the first n terms of an arithmetic series is given by

$$S_n = \frac{n}{2}(a_1 + a_n).$$

Example 5 **Find the sum of the first 60 terms in the arithmetic series $9 + 14 + 19 + \cdots + 304$.**

$30.(9 + 304)$

17-41 oM