recursive formula: defines the terms in a sequence by relating each term to the one before it.

	a_1	a_2	a_3	a_4
Square side length:	1	2	3	4
perimeter:	4	8	12	16

$a_1 = 4$
$a_2 = (a_{2-1}) + 4$
$a_n = (a_{n-1}) + 4$
$a_4 = (a_3) + 4$

$a_n = a_{n-1} / 2$

a_1 a_2 a_3 a_4 a_5 a_6
2, 4, 6, 8, 10, 12

add 2 in each case

$a_n = a_{n-1} + 2$
$a_4 = a_{4-1} + 2$
$= a_3 + 2$

$a_3 + 2 = a_4$

explicit formula: a formula that expresses the n^{th} term in terms of n

3 Backstreet Boys songs per day. Every day in September I add three more songs to the number I listen to each day.

	a_1	a_2	a_3	...	a_{25}
Day	1	2	3		
# BSB songs	3	6	9		

$a_n = n \times 3$
$a_{25} = 25 \times 3$
$= 75$

Common difference!

* In an arithmetic sequence, the difference between consecutive terms is constant, and it's called the common difference (d)
Can be positive or negative

recursive formula
a_1 → given value
$a_n = a_{n-1} + d$

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

Ingesting ready to raise money for SGA. I already have $1,000. We decide to have a car wash, and we charge $5 per car. How much money will we have raised by the time the 3rd car arrives?

	a_1	a_2	a_3
	1st car	2nd car	3rd car
	$1,000	$1,005	$1,015

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

* Arithmetic mean can help find a missing number in a sequence

$\frac{\$1,005 + \$1,015}{2} = \$1,010$

arithmetic series: a summed series whose terms form an arithmetic sequence

Sequence → 5, 10, 15, 20, 25, 30
series → 5+10+15+20+25+30

	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}
# of songs	3	6	9	12	15	18	21	24	27	30

$3 + 6 + 9 + 12 + 15 + 18 + 21 + 24 + 27 + 30$

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Sum of a finite arithmetic series

$S_n = \frac{n}{2}(a_1 + a_n)$
$S_{10} = \frac{10}{2}(3 + 30)$
$S_{10} = 5(33)$
$= 165$

You can also use the summation symbol Σ to write a series, and you can use limits to indicate how many terms you're adding.

$\sum_{n=1}^{60} (5n+1)$

upper limit: greatest value of n
explicit formula for the sequence
lower limit: least value of n
a_n

$S_n = \frac{n}{2}(a_1 + a_n)$
$S_{60} = \frac{60}{2}(6 + 301)$
$S_{60} = 30(307)$
$= 9,210$

$a_1 = 5(1) + 1 = 6$
$a_2 = 5(2) + 1 = 11$
$a_{60} = 301$
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HW: p. 591, #1-28, every 4th problem
p. 596, #1-28, every 4th, 53, 57, 71
p. 610, #1-28, every 4th, 31, 43, 45