

Precalculus - Sequences and Series - Worksheet

Common Core F-IF.A.3, F-BF.A.2, A-SSE.B.4 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

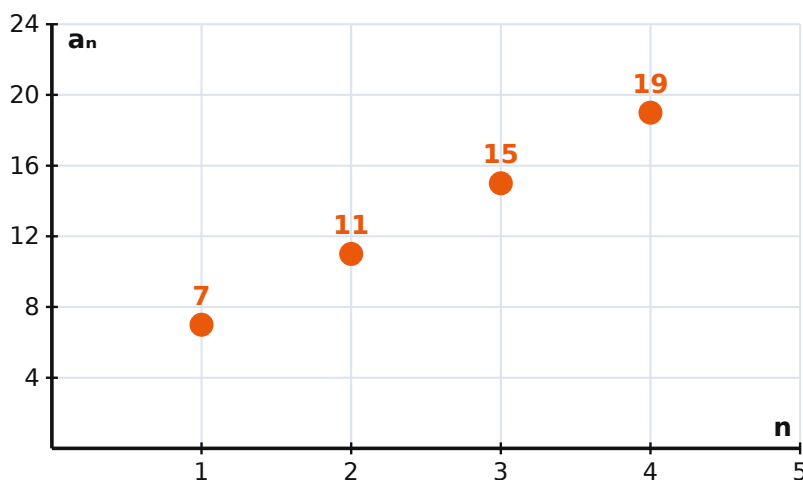
These 20 problems practice sequences and series (Common Core F-IF.A.3, F-BF.A.2 and A-SSE.B.4). You will write explicit and recursive formulas, find finite sums, use sigma notation and evaluate infinite geometric series.

Precalculus · Common Core State Standards: **F-IF.A.3, F-BF.A.2, A-SSE.B.4**

Exercise 1 - List terms

Write the first four terms of $a_n = 5 + 3(n-1)$.

Exercise 2 - Explicit arithmetic formula



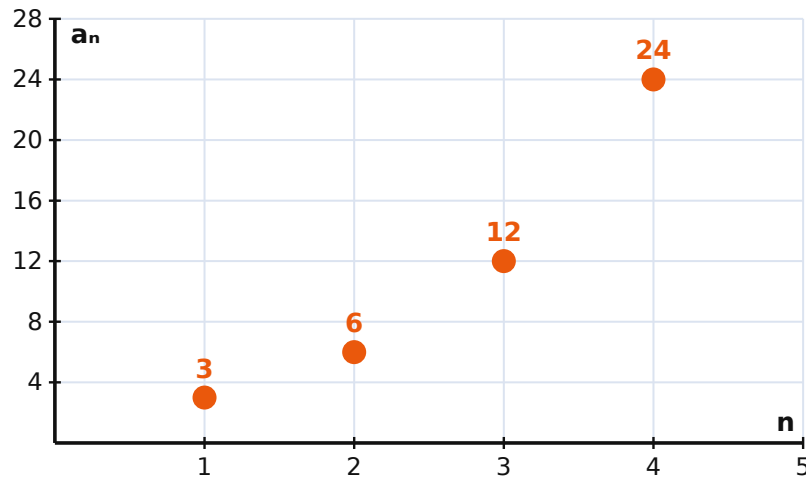
The sequence 7, 11, 15, 19, ...

Write an explicit formula for 7, 11, 15, 19, ... and find a_{20} .

Exercise 3 - Formula from two terms

An arithmetic sequence has $a_3 = 10$ and $a_8 = 25$. Find a_n .

Exercise 4 - Geometric formula



The sequence 3, 6, 12, 24, ...

Write an explicit formula for 3, 6, 12, 24, ... and find a_{10} .

Exercise 5 - Fractional ratio

Find the common ratio and the sixth term of the sequence 81, 27, 9, 3, ...

Exercise 6 - Recursive sequence

Let $a_1 = 2$ and $a_n = 3a_{n-1} - 1$. Find a_2, a_3, a_4 .

Exercise 7 - Recursive to explicit

A sequence has $a_1 = 5$ and $a_n = a_{n-1} + 4$. Write an explicit formula.

Exercise 8 - Sum of the first 100 integers

Find $1 + 2 + 3 + \dots + 100$.

Exercise 9 - Arithmetic series

Find the sum of the first 30 terms of 5, 8, 11, ...

Exercise 10 - Sum of 20 terms

Find the sum of the first 20 terms of 7, 11, 15, ...

Exercise 11 - Sigma notation

Evaluate $\sum_{k=1}^5 (2k+1)$.

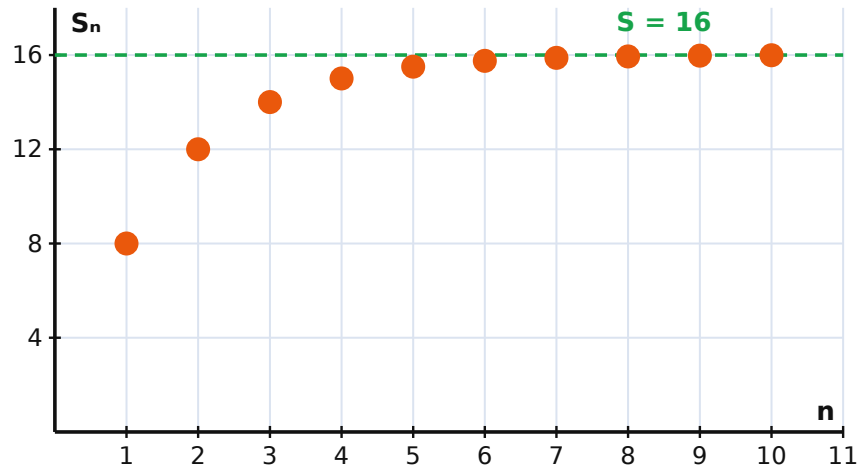
Exercise 12 - Sigma with an arithmetic formula

Evaluate $\sum_{k=1}^{40} (3k-2)$.

Exercise 13 - Geometric series

Find $2+6+18+ \dots$ (6 terms).

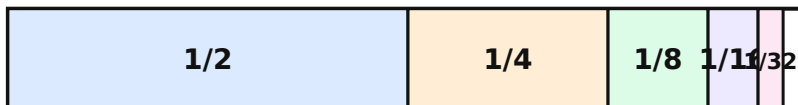
Exercise 14 - Partial sum of a convergent series



Partial sums of a series approaching a limit.

Find the sum of the first 8 terms of $1+\frac{1}{2}+\frac{1}{4}+ \dots$.

Exercise 15 - Infinite geometric series



$\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$ gets closer and closer to 1

A bar split into halves.

Find the sum of $8+4+2+1+ \dots$.

Exercise 16 - Sigma with infinity

Evaluate $\sum_{k=1}^{\infty} 3(0.4)^{k-1}$.

Exercise 17 - Converge or diverge?

Decide whether each series has a sum, and find it if it does: (a) $2+6+18+\dots$; (b) $5-\frac{5}{2}+\frac{5}{4}-\dots$.

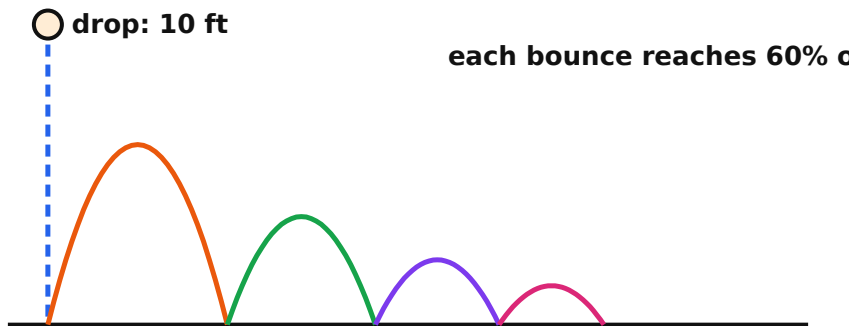
Exercise 18 - Repeating decimal

Write $0.\overline{36}$ as a fraction using a geometric series.

Exercise 19 - Salary

Priya's starting salary is \$42,000 and she gets a \$2,000 raise each year. Find her salary in year 10 and her total earnings over 10 years.

Exercise 20 - Bouncing ball



A ball bouncing to 60 percent each time.

A ball is dropped from 10 ft and bounces up to 60% of its previous height each time. Find the total distance it travels (up and down) before coming to rest.

Exercise 21 - Doubling pennies

On day 1 Noah saves 1 cent, and each day he saves double the previous day. How many dollars has he saved after 20 days?