Fibonacci Day maths for CBSE Class 10: Class 11

CBSE Math Revision · CBSE Class 11 (no calculator) · 23 November · Student sheet

Name _____ Class _____ Date _____

No calculator. Every answer works out exactly.

Starter (5 minutes)

1. Solve $x^2 - x - 1 = 0$.

2. $a_1 = a_2 = 1$ and $a_n = a_{n-1} + a_{n-2}$. Find a_{10}.

3. Find $1 + 2 + 4 + \ldots + 512$.

4. In how many ways can 4 different books be arranged on a shelf?

Main activity (30 minutes)

Task A: The golden ratio

Let $\varphi = (1 + \sqrt{5})/2$.

a. Show that $\varphi^2 = \varphi + 1$, and write φ^2 in the form $(a + \sqrt{5})/2$.

b. Show that $1/\varphi = \varphi - 1$, and write $1/\varphi$ in the form $(\sqrt{5} - 1)/2$.

c. Find φ^3 in the form $a + b\sqrt{5}$.

Task B: Climbing the stairs

You climb a staircase 1 or 2 steps at a time.

a. List all the ways to climb 4 steps. How many are there?

b. How many ways are there to climb 8 steps?

c. How many ways are there to climb 8 steps using exactly two 2-steps?

Extension

1. Find the sum of the first 10 Fibonacci numbers, and check that it is 1 less than the 12th.