The ProbLemma's Channel Season 2 Guide

Season 2 Episode 1: Seven Gallons Of Water On The Wall (Reinterpret And Conquer)
- Problem S2M1 solved:
  - Mathematical Billiard
- Problem S2M2 formulated:
  - Problem S2M2: an alternative expression for a finite sum of squares of consecutive whole positive numbers

Season 2 Episode 2: A Weighty Question (Reinterpret And Conquer)
- Problem S2M2 solved:
  - Center Of Mass
- Problem S2M3 , Swan Lakes, formulated:
  - Problem S2M3: swans landing on lakes via the half of all swans plus half-a-swan rule

> ▶☰ The above 2 episodes with S1E8 and S1E9 form the "Reinterpret And Conquer" play list.

Season 2 Episode 3: Swan Lakes (Reverse Order)
- The mechanics of the "Reverse Order" problem-solving approach explained
- Problem S2M3 solved
- Problem S2M4, The Devil And A Loiterer, formulated:
  - S2M4: a loiterer crossing a bridge

Season 2 Episode 4: The Devil And A Loiter (Reverse Order)
- The mechanics of the "Reverse Order" problem-solving approach explained again
- Problem S2M4 solved
- Problem S2M5 formulated:
  - S2M5: magic apples gathered by a peasant
- Problem S2M6 formulated:
  - S2M6: apple injections
- Problem S2M7 formulated:
  - S2M7: an equilateral triangle in a square

Season 2 Episode 5: Apples Of Discord (Reverse Order)
- Problems S2M5, S2M6, S2M7 solved
- Problems S2M8 and S2M9 formulated
  - S2M8: an isosceles triangle in a trapezoid

○ S2M9: external and internal tangents to two circles

Season 2 Episode 6: On The Tangent (Reverse Order)
- Problems S2M8 and S2M9 solved
- Problem S2CS1 formulated:
  ○ S2CS1: 2 eggs versus 100-story building

Season 2 Episode 7: Two Eggs Versus One Building (Reverse Order)
- Problem S2CS1 solved
- Problem S2M10 formulated:
  ○ S2M10: horses and carrots, gamels and bananas

Season 2 Episode 8: Horses Eating Carrots, Discrete Rocket Propulsion (Reverse Order)
- Problem S2M10 solved
- Problem S2M11 formulated:
  ○ S2M11: An odd colony of infinitely excitable cells

Season 2 Episode 9: An Add Colony Of Infinitely Excitable Cells (Reverse Order)
- Problem S2M11 solved
- Problem S2M12 formulated:
  ○ S2M12: Zero in a recurrence relation

Season 2 Episode 10: Zero in a recurrence relation (Reverse Order)
- Problem S2M12 solved
- Problem S2M13 formulated:
  ○ S2M13: peasant, goat, cabbage, wolf crossing a river

> ▶▤ The above five episodes form the "Reverse Order" play list.

Season 2 Episode 11: Peasant. Goat. Cabbage. Wolf (Space-Time)
- The mechanics of "Space-Time" explained
- Problem S2M13 solved
- Problem S2M14 formulated:
  ○ S2M14: find a fake coin in a set 12 using 3 weighings on pan scales, an adaptive approach

Season 2 Episode 12: Not Blind Mathematical Justice (Space-Time)
- Problem S2M14 solved (via an adaptive approach)
- Problem S2M15 formulated:
  ○ S2M15: find a fake and heavy coin in a set of 18 using 3 non-adaptive weighings on pan scales

Season 2 Episode 13: Blind Mathematical Justice (Space-Time)
- Problem S2M15 solved (via a non-adaptive approach)
- Problem S2M16 formulated:
  - S2M16: put together at least one fake coin detection problem that admits at least one geometric solution

Season 2 Episode 14: Geometry In Fake Coin Detection Problems (Space-Time)
- Problem S2M16 solved (a geometry of a non-adaptive approach)
- Problem S2M17 formulated:
  - S2M17: decompose the $\log\left(\Gamma(x)\right)$ function into its Fourier series over the interval $(0, 1]$

> ▶≣ The above four episodes are in the "Space Time" play list.

Season 2 Episode 15: Fourier Series of $\log\left(\Gamma(x)\right)$ over $(0, 1]$
- Problem S2M17 solved
- Problem S2M18 formulated:
  - S2M18: find the number of times a minute hand will rendezvous with the hour hand on the face of the standard analogue 12-hour clock in one 12-hour period starting from 12 o'clock

Season 2 Episode 16: A Chase Around The Clock (Equation)
- Problem S2M18 solved
- Problem S2M19 formulated:
  - S2M19: generate a proof of the Pythagorean Theorem based on the Equation problem-solving approach

Season 2 Episode 17: Pythagorean Theorem Via Equations (Equation)
- Problem S2M19 solved
- Problem S2M20 formulated:
  - S2M20: solve an equation of order 4

Season 2 Episode 18: Now You Know Me, Now You Don't (Equation)
- Problem S2M20 solved
- Problem S2M21 formulated:
  - S2M21: effectiveness of advertisement

Season 2 Episode 19: Effectiveness Of Advertisement (Equation)
- Problem S2M21 solved
- Problem S2M22 formulated:
  - S2M22: Fresnel Integrals Via Equations

Season 2 Episode 20: Fresnel Integrals Via Equations (Equation)
- Problem S2M22 solved
- Problem S2M23 formulated:
  - S2M23: number of such 5-digit perfect squares that if each digit of that perfect square is increased by 1 then a new perfect square results (Scope Reduction)

> ▶≣ The above five episodes are in the "Equation" play list.

Season 2 Episode 21: Heavy perfect 5-digit squares (Scope Reduction)
- Problem S2M23 solved
- Problem S2M24 formulated:
  - S2M24: find the locus of points on a sphere each of which is equidistant from 3 given fixed distinct points on that sphere, no two of which are antipodal (Scope Reduction)

The ProbLemma's Channel Season 2 Index

Problem Number	Formulated In	Solved In
S2M1	Season 1 Episode 9	Season 2 Episode 1
S2M2	Season 2 Episode 1	Season 2 Episode 2
S2M3	Season 2 Episode 2	Season 2 Episode 3
S2M4	Season 2 Episode 3	Season 2 Episode 4
S2M5	Season 2 Episode 4	Season 2 Episode 5
S2M6	Season 2 Episode 4	Season 2 Episode 5
S2M7	Season 2 Episode 4	Season 2 Episode 5
S2M8	Season 2 Episode 5	Season 2 Episode 6
S2M9	Season 2 Episode 5	Season 2 Episode 6
S2CS1	Season 2 Episode 6	Season 2 Episode 7
S2M10	Season 2 Episode 7	Season 2 Episode 8
S2M11	Season 2 Episode 8	Season 2 Episode 9
S2M12	Season 2 Episode 9	Season 2 Episode 10
S2M13	Season 2 Episode 10	Season 2 Episode 11
S2M14	Season 2 Episode 11	Season 2 Episode 12
S2M15	Season 2 Episode 12	Season 2 Episode 13
S2M16	Season 2 Episode 13	Season 2 Episode 14
S2M17	Season 2 Episode 14	Season 2 Episode 15
S2M18	Season 2 Episode 15	Season 2 Episode 16