



# 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. Wolfe (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  $\log(\Gamma(x))$  function into its Fourier series over the interval  $(0, 1]$ .



The above four episodes are in the “Space Time” play list.

## The ProbLemma's Channel Season 2 Index

Problem Number	Formulated In	Solved In
S2M1	<a href="#">Season 1 Episode 9</a>	<a href="#">Season 2 Episode 1</a>
S2M2	<a href="#">Season 2 Episode 1</a>	<a href="#">Season 2 Episode 2</a>
S2M3	<a href="#">Season 2 Episode 2</a>	<a href="#">Season 2 Episode 3</a>
S2M4	<a href="#">Season 2 Episode 3</a>	<a href="#">Season 2 Episode 4</a>
S2M5	<a href="#">Season 2 Episode 4</a>	<a href="#">Season 2 Episode 5</a>
S2M6	<a href="#">Season 2 Episode 4</a>	<a href="#">Season 2 Episode 5</a>
S2M7	<a href="#">Season 2 Episode 4</a>	<a href="#">Season 2 Episode 5</a>
S2M8	<a href="#">Season 2 Episode 5</a>	<a href="#">Season 2 Episode 6</a>
S2M9	<a href="#">Season 2 Episode 5</a>	<a href="#">Season 2 Episode 6</a>
S2CS1	<a href="#">Season 2 Episode 6</a>	<a href="#">Season 2 Episode 7</a>
S2M10	<a href="#">Season 2 Episode 7</a>	<a href="#">Season 2 Episode 8</a>
S2M11	<a href="#">Season 2 Episode 8</a>	<a href="#">Season 2 Episode 9</a>
S2M12	<a href="#">Season 2 Episode 9</a>	<a href="#">Season 2 Episode 10</a>
S2M13	<a href="#">Season 2 Episode 10</a>	<a href="#">Season 2 Episode 11</a>
S2M14	<a href="#">Season 2 Episode 11</a>	<a href="#">Season 2 Episode 12</a>
S2M15	<a href="#">Season 2 Episode 12</a>	<a href="#">Season 2 Episode 13</a>
S2M16	<a href="#">Season 2 Episode 13</a>	<a href="#">Season 2 Episode 14</a>