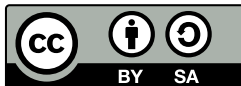


Game Theory

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What is game theory?

Introduction

“Game theory is about finding a way to rig games in your favour”



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— Vincent Macri



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Pick Up Sticks!

The most accurately named game of all time.



Rules and intro

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Starting with n sticks, the players take turns taking up to k sticks from the total number of sticks until there are none left.

Variations include the winner being the one who takes the last stick, or the loser being the one who takes the last stick.



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Pick up sticks is a 2 player game that is often used as a game theory question on math contests. The game involves:

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Variations include the winner being the one who takes the last stick, or the loser being the one who takes the last stick.

The game can be structured in such ways that certain players can win every time. Lets look at some of these scenarios!



The scenarios: your worksheet

Pick Up Sticks!

Let's go over some scenarios.



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Scenario 1 Whoever picks the last stick **loses**. Which player can guarantee a win?

There are 24 sticks in total, and the players can take up to 4 sticks.



The scenarios: your worksheet

Pick Up Sticks!

Let's go over some scenarios.

Scenario 1 Whoever picks the last stick **loses**. Which player can guarantee a win?

There are 24 sticks in total, and the players can take up to 4 sticks.

Scenario 2 Whoever picks the last stick **wins**. Which player can guarantee a win?

There are 35 sticks, and the players can take up to 4 sticks on their turns.



Try it out yourself!
Pick Up Sticks!

Try it out yourself!



Answers: The Strats

Pick Up Sticks!

Let's take those scenarios up together.



Answers: The Strats

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Scenario 1 Player 1 always wins. Why?



Answers: The Strats

Pick Up Sticks!

Let's take those scenarios up together.

Scenario 1 Player 1 always wins. Why?

Scenario 2 Player 2 always wins. Why?

