Conway Rational Tangles in a Pandemic World
JMM 2022
SIGMAA Special Session on Math Outreach Activities that Engage Diverse Audiences

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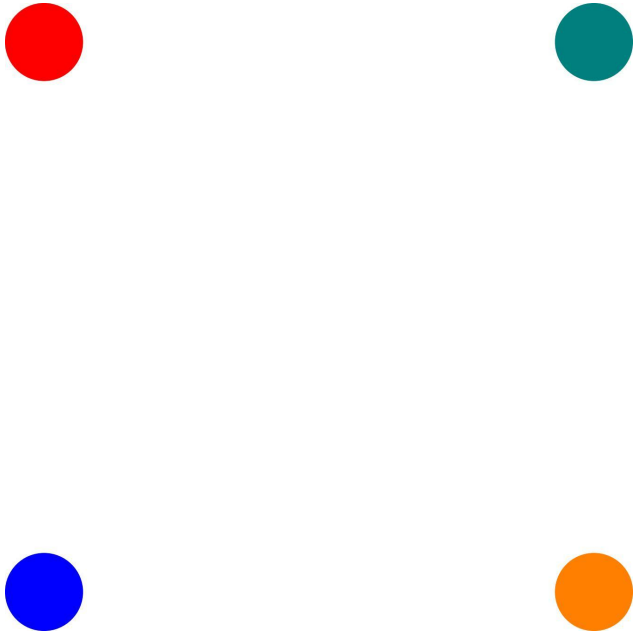
montana state university BILLINGS

Rational Tangles

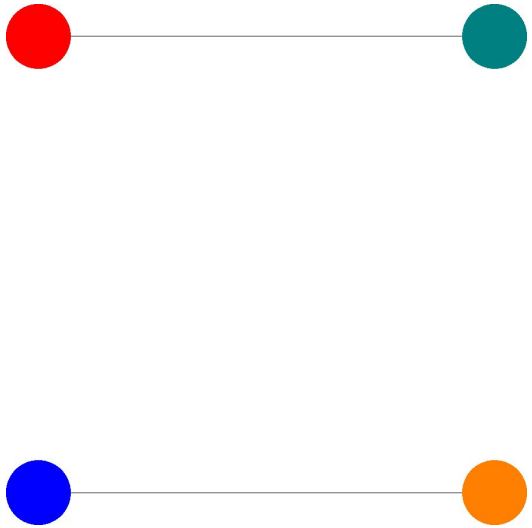
Rational Tangles was one of our most popular activities pre-pandemic!

Rules for Rational Tangles



Rules for Rational Tangles

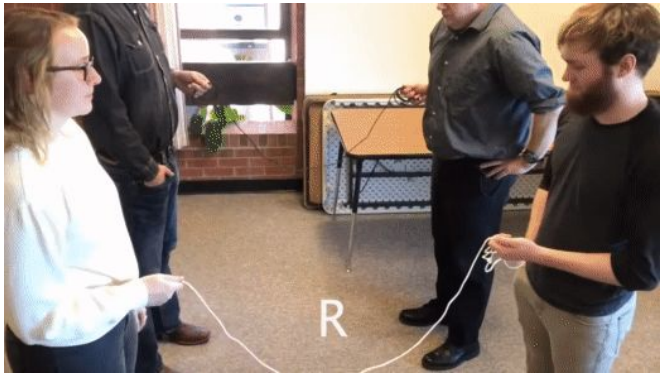
0-position

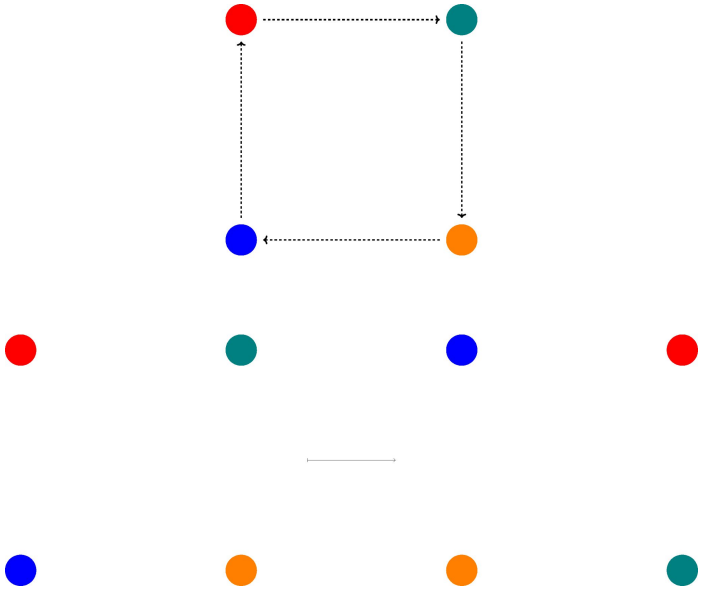


This position corresponds with value “0”.

Rules for Rational Tangles

Rotate (R)





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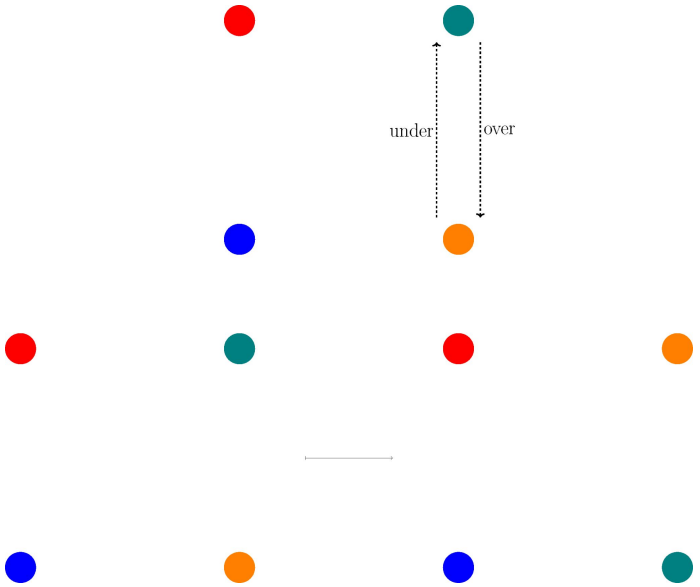
Rules for Rational Tangles

Twist (T)



Rational Tangles Zoom Edition!

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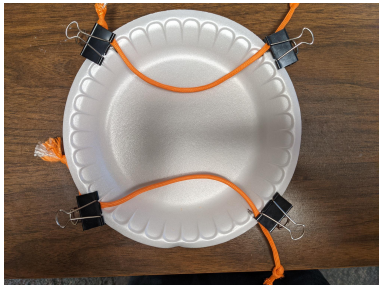
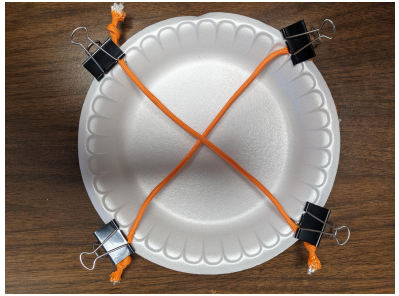
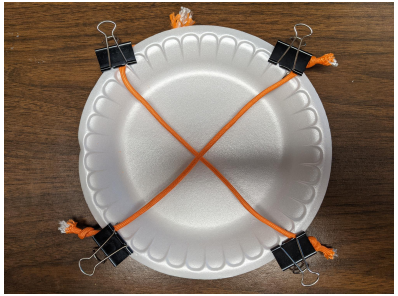
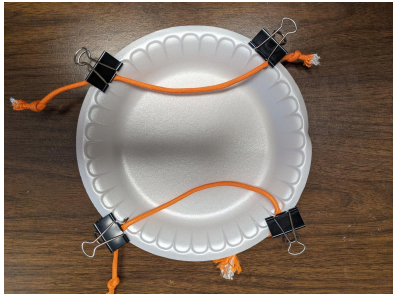
Try T, R,
T!

T R T

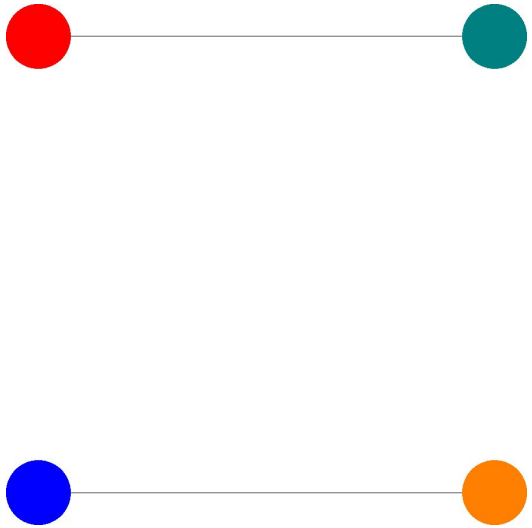





In Groups!

- Can you revert TT back to the original position?
- Can you revert TTT back to the original position?
- Can you revert TTTT back to the original position?
- Can you revert T^n back to the original position? Test it out!

Rules for Rational Tangles

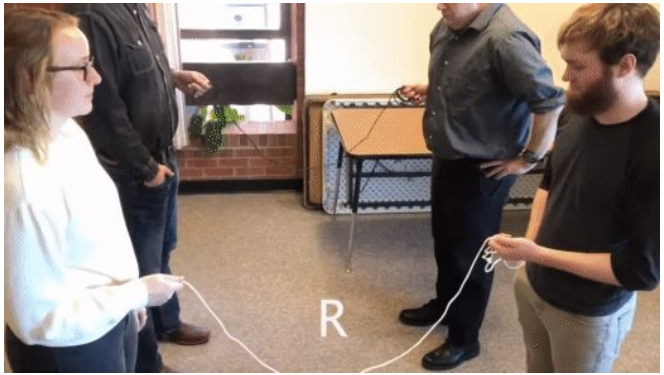
0-position

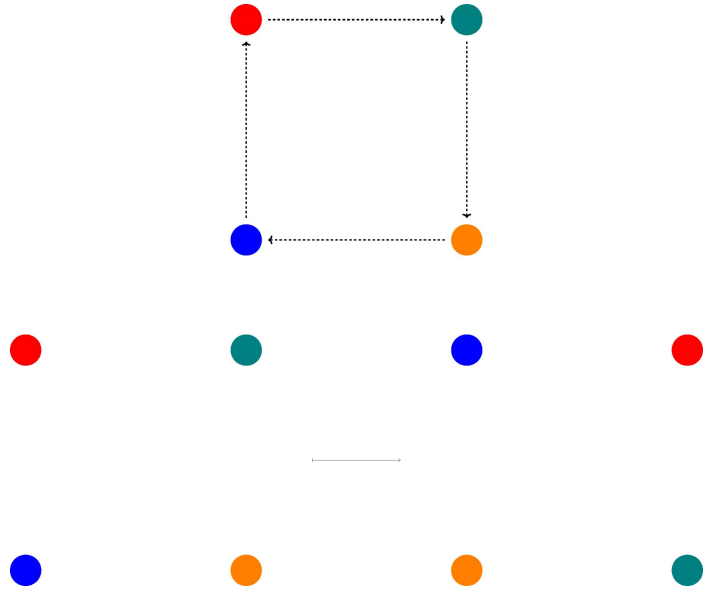


This position corresponds with value “0”.

Rules for Rational Tangles

Rotate (R)



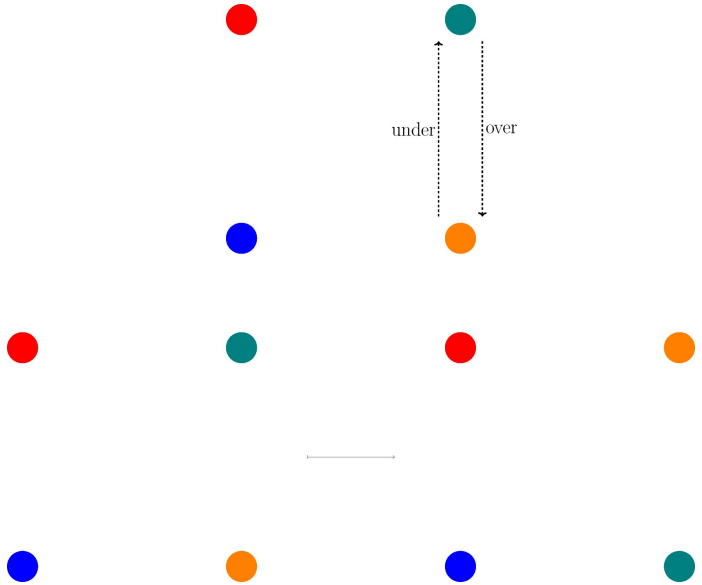


This move corresponds with “taking the negative reciprocal”.

(-1/0=∞, -1/∞=0.)

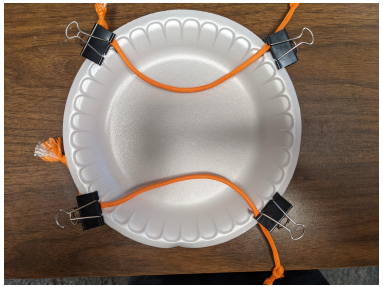
Rules for Rational Tangles

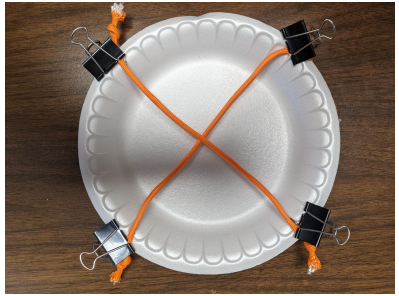
Twist (T)

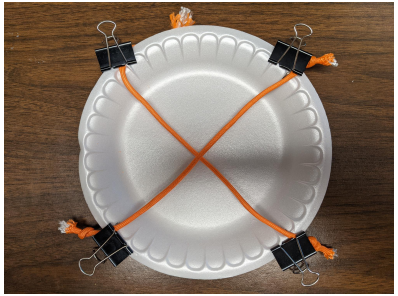


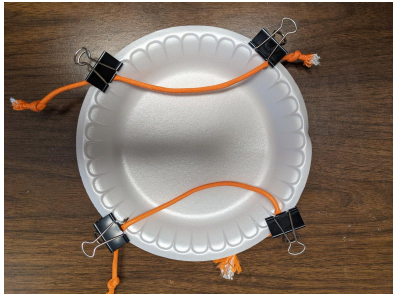
This move corresponds with “+1”.

T R T









0 1 -1 0

In Groups

- Can you create the tangle associated with -⅖?
- Can you revert to the original position?
- Take turns picking fractions, can you create the associated tangle? Can you revert to the original position?
- Can you create any fraction of your choice? Can you invert any fraction?

THANK YOU

Thank you to Lauren Rose, James C. Taylor. The MCTS SIGMAA, and the organizers of JMM!