

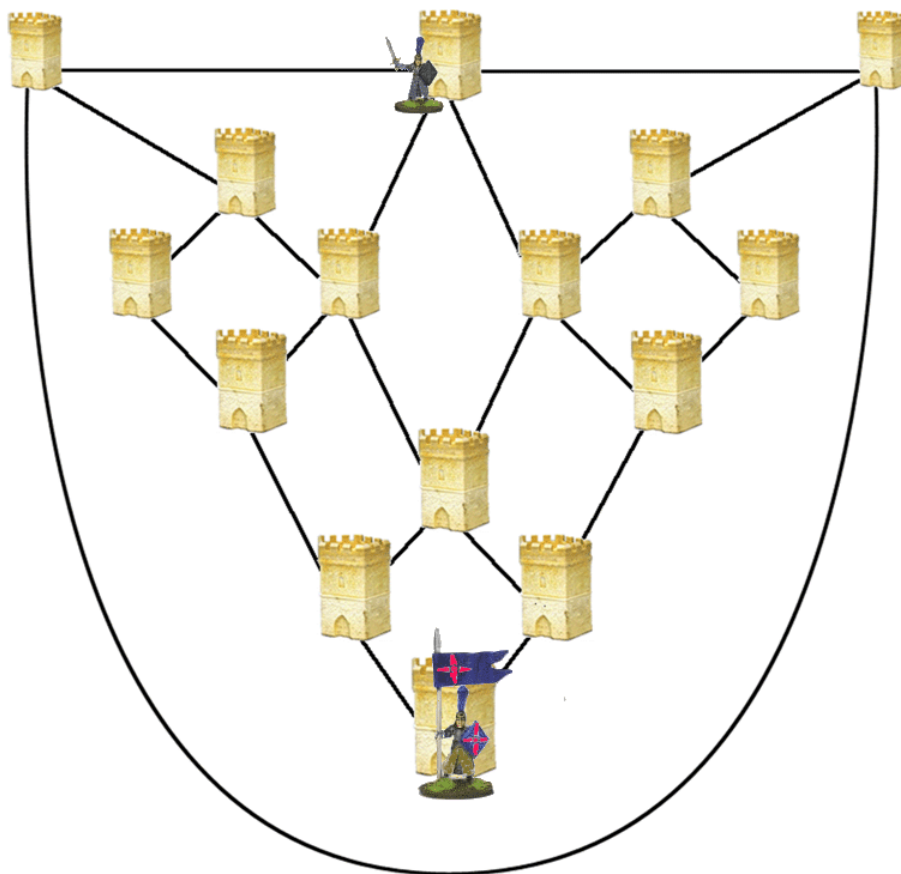
King Arthur's Standard Bearer



King Arthur sits on his throne and broods. Stanley, his standard bearer has wandered off again - feasting his way through the kingdom from castle to castle. Worst of all, Stanley is not carrying his dignified 3-crowned standard and has instead taken to strutting around like a peacock with a bright blue and pink standard which King Arthur outlawed.

What is Arthur to do? Every moment that Stanley is out wandering around in that dreadful attire is too much. King Arthur summons Sir Gareth, Knight of the Round Table and asks him to capture Stanley, and bring him back home so that he may be dressed in the proper, somber, attire expected of the King's standard bearer.

Sir Gareth (top middle) and Stanley the standard bearer (bottom middle) take turns moving to a nearby (connected) castle.



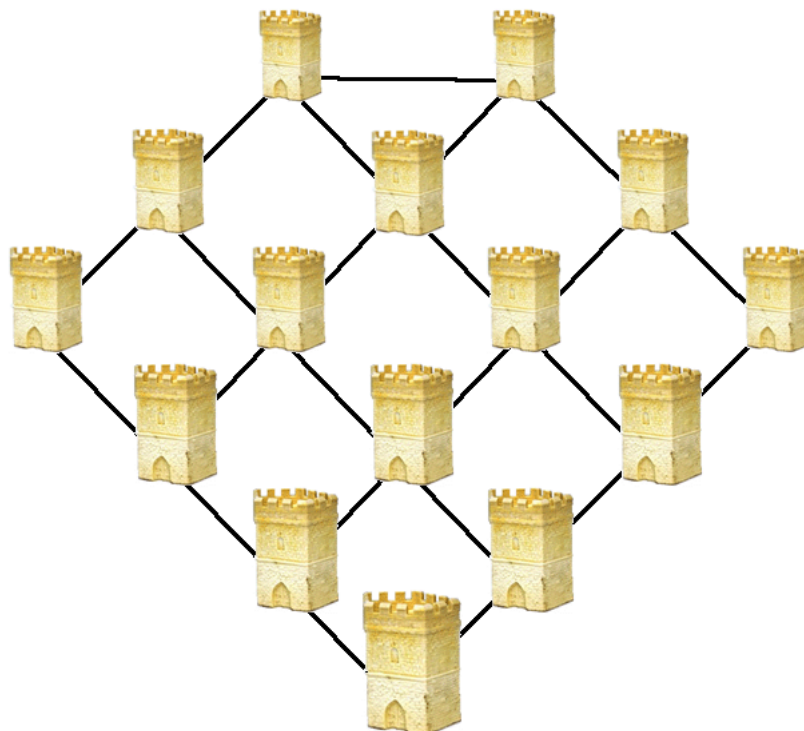
- How many turns does it take for Sir Gareth to catch Stanley if Sir Gareth moves first?
- How many turns does it take for Sir Gareth to catch Stanley if Stanley moves first?



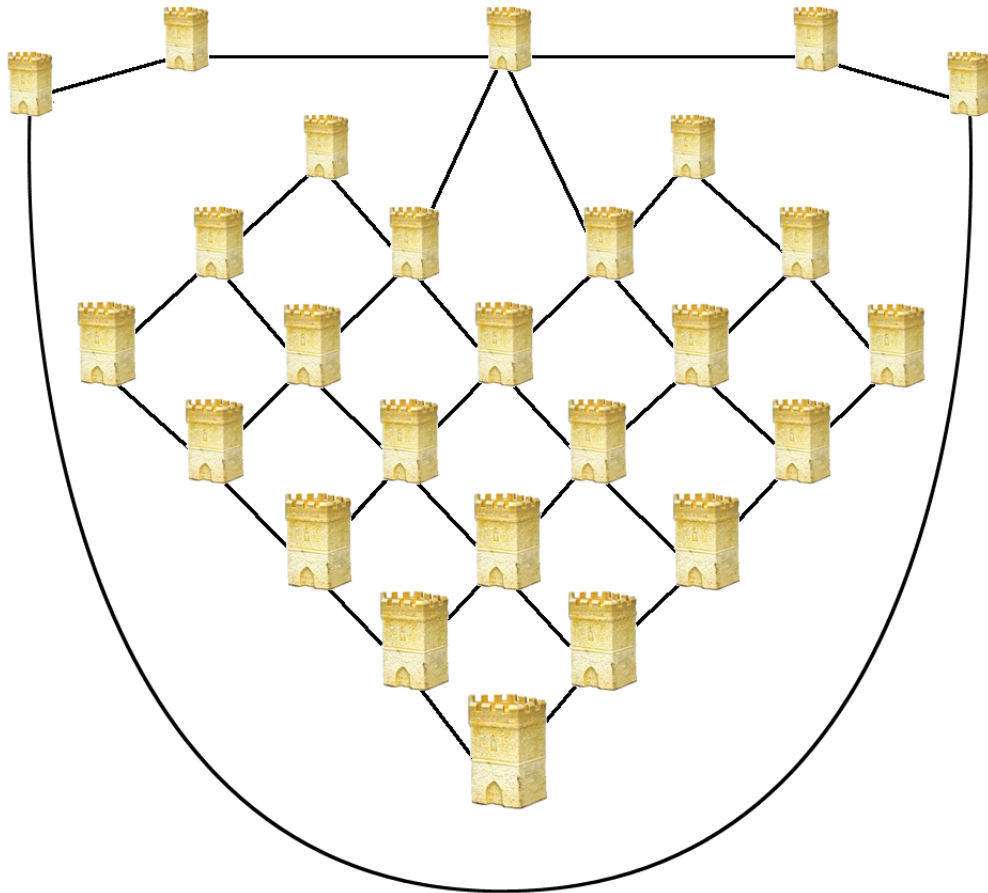
The same problem redesigned as a frog trying to catch a fly

Extensions:

- Could Sir Gareth catch two standard bearers if they both started in the same location?
- Could Sir Gareth catch three standard bearers?
- Create exactly the same game with the castles below. Why are the two games identical?



- A few years later the same thing happens again, but this time the number of castles has increased. Sir Gareth starts in the top central castle and Stanley starts in the bottom castle:



- How many turns does it take for Sir Gareth to catch Stanley if Sir Gareth moves first?
- How many turns does it take for Sir Gareth to catch Stanley if Stanley moves first?
- Would anything change if more castles were added around the outside loop?
- Could Sir Gareth catch two standard bearers if they both started in the same location?
- Could Sir Gareth catch three standard bearers?
- What fraction of a very large number of standard bearers could Sir Gareth capture?
- What is the smallest number of castles in a loop in which the standard bearer always escapes if he chooses where to begin after you choose where to begin? Is the solution the same if the thief must move first?
- Create your own puzzle using Sir Lancelot and Sir Gareth both searching for Stanley. What is the smallest number of castles in which Stanley can always escape?

The Math in This Problem:

Students will practice strategic analysis while arriving at solutions for how many moves each knight must take in order to catch the other. This investigation is associated with basic game theory, which is a branch of mathematics attempting to capture behaviour in strategic situations.