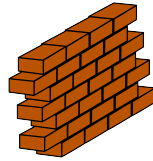
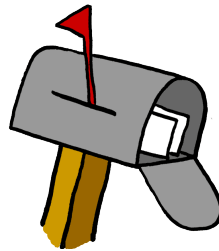


UW Math Circle
November 17, 2016

1. You have a pile of 1×2 foot bricks, and want to build a wall that is 2 feet high. How many different walls can you build that are 2 feet high and 24 feet long?



2. A mail carrier delivers mail to the nineteen houses on the east side of Elm Street. The carrier notices that no two adjacent houses ever get mail on the same day, but that there are never more than two houses in a row that get no mail on the same day. How many different patterns of mail delivery are possible?



3. 16 people are seated at a round table. How many ways are there for each person to shake hands with one other person, so that no one's arms cross anyone else's?

4. (a) Get a coin, flip it 10 times, and record the longest string of heads. For example, if I got HHTHTHHHTT I would record 3. Do this several times, and share your results with your neighbors. What is the most common number?
- (b) Find the number of ways you can flip a coin 5 times so that there is a sequence of two or more heads in a row.
- (c) You flip a coin, and it is a head. You are going to flip 5 more coins– how many ways are there for you to get three or more heads in a row?
- (d) You flip a coin, and it is a tail. You are going to flip 5 more coins– how many ways are there for you to get three or more heads in a row?
- (e) Find the number of ways you can flip a coin 6 times so that there is a sequence of three or more heads in a row.
- (f) Find the number of ways you can flip a coin 10 times so that there is a sequence of 3 or more heads in a row.