

RECENT PAPER DECENT PUZZLE

with DAN RISKIN

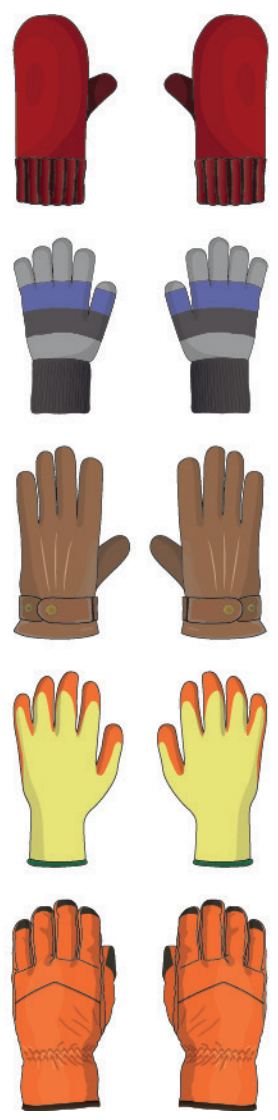
TEN GLOVES

PUZZLE # 034
MARCH 20, 2017



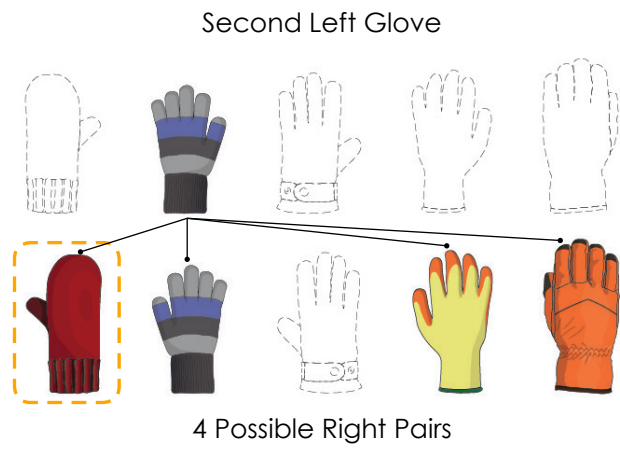
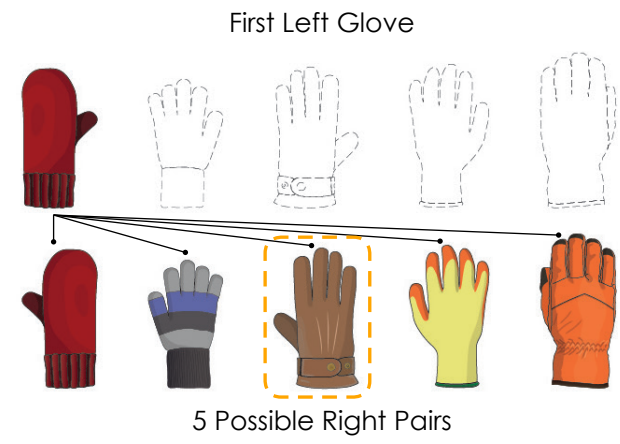
The Question

You have 5 right-handed gloves and 5 left-handed gloves.
How many different ways can you line them up into 5 left-right pairs?



5 Left and 5 Right Gloves

Pairing Options For First And Second Gloves



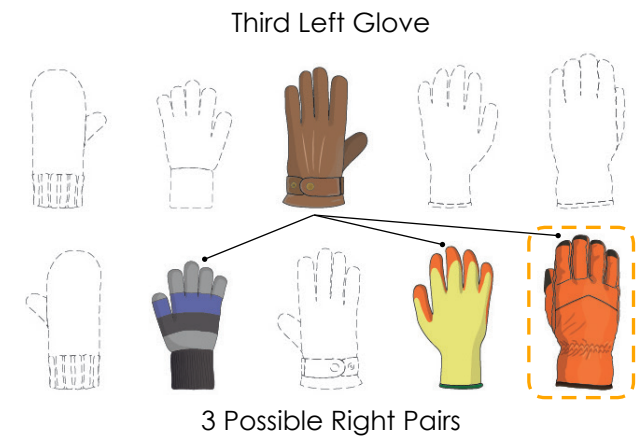
The First Glove Pair:

To solve this puzzle we need to figure out how many ways we can make 5 left-right pairs of gloves.

We can match up each left glove, one at a time with right gloves, and see how many options there are for each.

The first left glove can be matched with any of the 5 right gloves. While the second left glove only has 4 to be paired with, since one is already paired with the first glove.

Pairing Options For Third And Fourth Gloves



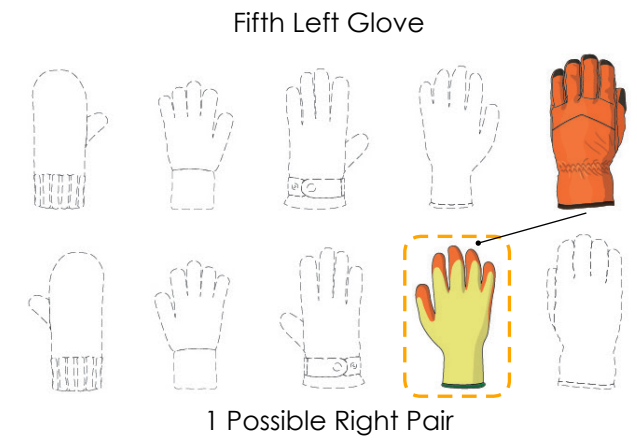
Number Of Possible Pairings:

After pairing up 2 sets, there are already 20 different possible matches:

$$5 \text{ options (for glove 1)} \times 4 \text{ options (for glove 2)} = 20$$

With each consecutive pair, the number of gloves that can be matched is decreased by 1.

Pairing Of Final Glove



Solution:

Since there are 5 pairs to be made, we can multiply the number of possible pairings for each glove to find out the total number of options.

$$\# \text{ of Possible Pairings} = 5 \times 4 \times 3 \times 2 \times 1 = 120$$

This solution is also 5 factorial (5!). Therefore, there are 120 different ways to line up the 10 gloves into left-right pairs.