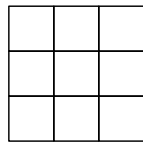




Try these problems before watching the lesson.

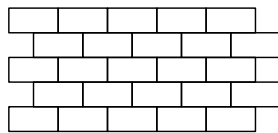
1. How many different squares of any size are there on the 3×3 board below?



2. In how many ways can 45 cents be made using any combination of quarters, dimes, and nickels?
3. A dresser has five drawers stacked vertically. To be able to reach the contents in an open drawer, the drawer that is directly above the open drawer may not be open at the same time. In how many ways can one or more drawers be open so that the contents in each of the open drawers can be reached?
4. How many ordered triples (x, y, z) of positive integers have the property that $x + y + z = 6$?



First Problem: The figure shows five rows, each containing five bricks. In how many ways can Mario choose five bricks, one in each row, so that any two bricks chosen in adjacent rows are adjacent?



Second Problem: The number 40,231 is a five-digit positive integer that uses five consecutive digits, although not necessarily in order. How many such five-digit numbers are there?

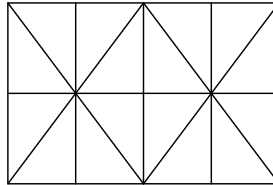
Third Problem: How many ordered triples of integers (x, y, z) satisfy $x^2 + y^2 + z^2 < 3$?




5. Ashley, Brett, Chris, and Diane are competing in a race. Eric sees the race and comments,
- (1) “Ashley beat both Brett and Chris”
 - (2) “Diane finished between Brett and Chris”

If exactly one of Eric’s statements is correct and there were no ties, how many different orders of finish are possible?

6. How many triangles are in the figure below?



7. How many collections of six positive, odd integers have a sum of 18? Note that $1 + 1 + 1 + 3 + 3 + 9$ and $9 + 1 + 3 + 1 + 3 + 1$ are considered to be the same collection.
8. A bag contains ten identical blue marbles and ten identical green marbles. In how many distinguishable ways can five of these marbles be put in a row if there are at least two blue marbles in the row and every blue marble is next to at least one other blue marble?

 *Share Your Thoughts*

Have some thoughts about the video? Want to discuss the problems on the Activity Sheet? Visit the MATHCOUNTS Facebook page or the Art of Problem Solving Online Community (www.artofproblemsolving.com).