

MATHCOUNTS[®] Problem of the Week Archive

National Competition – May 6, 2019

Problems

On Sunday, May 12th, 224 of the nation's most talented middle-school math minds will be in Orlando, FL for the 2019 Raytheon MATHCOUNTS National Competition. The stakes are high, and the problems will be tough. Here are a few problems national competitors solved in 2018.

Sprint #17

In a card game, Nora draws cards at random, without replacement, from a deck of 21 cards. Twenty of the cards are numbered 1 through 20, and the other card is marked "Joker." Nora keeps all of the cards she draws before she draws the Joker. What is the probability that the cards Nora keeps include exactly four prime-numbered cards? Express your answer as a common fraction.

Target #7

A *4-up number* is defined as a positive integer that is divisible by neither 2 nor 3 and does not have 2 or 3 as any of its digits. How many numbers from 400 to 600, inclusive, are 4-up numbers?

Team #3

Captain Greenbeard's treasure chest holds 100 grams of a mix of gold, silver and bronze coins. The gold, silver and bronze coins each weigh 6 grams, 2 grams and 5 grams, respectively, and are worth 30 droubles, 8 droubles and 15 droubles, respectively. Greenbeard has at least one of each kind of coin. What is the greatest possible total value, in droubles, of the coins in the chest?