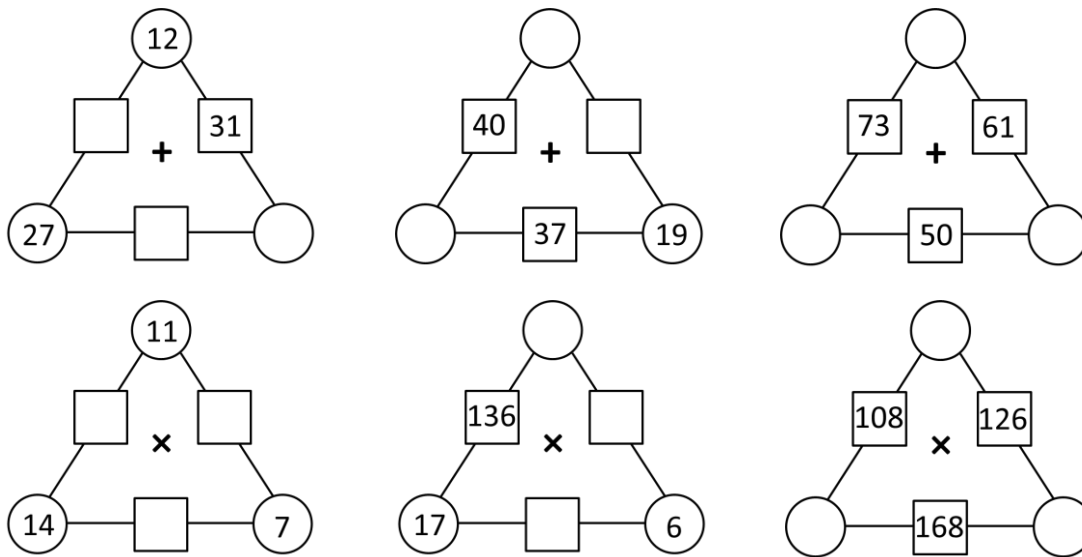# Weekly Challenge #7: Classic Number Challenges

Welcome to the Count on Us Secondary Challenge's seventh weekly challenge. In the coding and algebra round, there can be unexpected puzzles or problems that you won't know and cannot prepare for. Two years ago, in the final, teams had to solve arithmagons to complete the task. This challenge starts with those arithmagons and then follows with a selection of classic number puzzles to give an idea of what you might see.

Arithmagons: The number in the square is the sum or product of the numbers in the circles at the ends of the line it is in (look in the centre of the arithmagon).

Make 100: Move the digits and put in $+$, $-$, $\times$, $\div$ where you want to make this true.

$$1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9 \quad = \quad 100$$

Four fours: Make each of the numbers for 1 to 20 with this rule: use the number 4, exactly four times for each number. You can add, subtract, multiply or divide and combine the fours as you like.

For example, you can make 2 like this: $\frac{4}{4} + \frac{4}{4}$. You will need a different solution for 2 now!

Taxi Cab Number: Srinivasa Ramanujan, when told 1729 was a dull number said; "No, it is a very interesting number; it is the smallest number expressible as the sum of two cubes in two different ways". What are they? (Then, find out about Ramanujan and why it is a taxi cab number (of order 2)).