# Welcome Back Puzzles 2018-19

# Puzzle Contest 1

## (Parents and Grandparents)

**1.** **An evil dragon is tied to a pole in the ground** by an infinitely stretchy elastic cord attached to its tail. An armed grasshopper is on the pole watching the dragon. The dragon wants to run away. He jumps into the air and lands 10 m from the pole (with its tail still attached to the pole by the elastic cord). The grasshopper gives chase and leaps into the air, landing on the stretched elastic cord one meter from the pole. The dragon, seeing this, again leaps into the air and lands 10 m farther away from the pole (i.e., a total of 20 m from the pole). The grasshopper bravely leaps into the air again, landing on the elastic cord 1 m further from where it was just sitting on the cord. Once again the dragon jumps another 10 m and then the grasshopper jumps another 1 m along the cord, landing on the cord again. If this continues indefinitely, will the grasshopper ever catch up to the dragon? If it will, at what jump it will happen? **(60 pts.)**

**2.** **At the end of each summer, the fairy of flowers** arranges a colorful performance on her flower bed, which has the shape of a circle divided into seven equal parts. Each part, planted with beautiful flowers, the fairy colors in one of the colors of the rainbow, creating a unique arrangement of these seven colors every second. How long does this color play last? (In an arrangement, two or more parts may have the same color. However, two arrangements of seven colors are the same if they coincide when turning a flower bed) **(40 pts.)**