

# Welcome Back Puzzles 2018-19

## Puzzle Contest 1 Solutions

(grades 5 and Up)



**1. Christopher Robin gave 70 balloons** to Winnie-the-Pooh at the beginning of the school year. Immediately Winnie-the-Pooh shared with Piglet, Rabbit, and Eeyore as follows:

- ✓ each of them got at least 1 balloon;
- ✓ Winnie-the-Pooh left for himself more balloons than each of his friends got;
- ✓ Rabbit and Piglet got 45 balloons together.

How many balloons did Eeyore get and how many balloons did Winnie-the-Pooh leave for himself? **(60 points)**

**Answer:** 1 balloon for Eeyore and 24 balloons for Winnie-the-Pooh.

**Solution:** Since Rabbit's and Piglet's balloons together totaled 45, whoever of the two got more balloons must have gotten at least 23. Since Winnie-the-Pooh ended up with more than any of his friends, he must have kept at least 24 balloons for himself. This leaves  $70 - 45 - 24 = 1$  balloon for Eeyore. Any other possibility would not leave at least one for Eeyore while totaling 70.

**2. Two students are playing a game where they take turns**

**writing one digit**, each digit to the right of the last, until they have created a 30-digit number. They can use only the digits 1, 2, 3, 4 and 5. Student A wants the final number to be divisible by 9, and Student B wants to keep Student A from succeeding. If Student B starts, does a strategy exist for Student A to succeed? If so, what is it, if it not, why not? **(40 points)**

**Answer:** A strategy does exist.

**Strategy:** Student B writes any possible (1-5) first digit. Student A writes the digit that adds up to 6 with the previous written digit. Continuing by this rule, the sum of all digits of the 30-digit number will be 90, which is divisible by 9.