

Chapel Hill Math Circle
Intermediate Group (6-7)
March 5, 2016

1. Warmup: Ravi has the same number of brothers and sisters, but his sister Shakti has twice as many brothers as sisters. How many brothers and sisters does Shakti have?
2. The sum of some consecutive integers is 2009. If the smallest one is 29, which one is the largest one?
3. In Fairyland, every sunny day is immediately preceded by two consecutive rainy days. Moreover, five days after a rainy day, there is another rainy day. Today is a sunny day. For how many days, at most, can we accurately predict the weather?
4. Grandma Jenny has 10 grandchildren and all of them have different ages. Alice is the oldest. If the sum of her grandchildren's ages is 180, what is the youngest age that Alice can be?
5. How many natural numbers less than 2016 have an odd number of positive divisors?
6. Thirty scientists attend a conference. Each one is either a mathematician, a physicist, a chemist, or a biologist. The combined number of physicists and biologists is half the number of mathematicians. The combined number of physicists and chemists is twice the number of biologists. There is at least one physicist. How many mathematicians are there?
7. If we draw four semicircles on each side of a square with its sides as diameters, we obtain a four-petal flower. The area of the square is 64 cm^2 . What is the area of the four combined petals?

