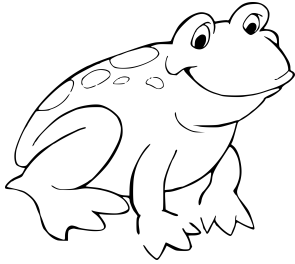


UW Math Circle

Homework

1. Balin needs two rubber bands for his hair. If he has 5 red rubber bands, 2 blue ones, 4 purple ones, and 12 black ones, what is the smallest number of rubber bands he could grab to ensure he has two of the same color?
2. In a faraway swamp, there are two kinds of animals: leeches and toads. If you ask a leech a question, it will always lie to you, and if you ask a toad, it will always tell the truth. There are four animals living in the swamp named Dan, David, Debbie, and Diana. They made the following statements:
Dan: "Diana and I are different species."
David: "Debbie is a leech."
Debbie: "David is a leech."
Diana: "Of the four of us, at least two are toads."
How many of these animals are leeches, and how many are toads?



3. There are 5 coins, three of which are real. One is fake and lighter than the real coins and the other is fake but heavier than the real coins. How can you determine which coins are fake using only three weighings?

