Extra Problems. VI.

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Medals

There is one gold medal, three silver medals and five bronze medals. It is known that one of the medals is fake and weighs less than the corresponding genuine one. Real medals made of the same metal weigh the same and from different metals do not. How can you use a balance scale to find the fake medal in two weighings?

Find a real one

There are 15 coins, out of which not more than seven are fake. All genuine coins weigh the same. Fake coins might not weigh the same, but they differ in weight from genuine coins. Can you find one genuine coin using a balance scale 14 times? Can you do it using fewer weighings?

In a row

There are ten coins in a row. Some are genuine and weigh 10 grams, some fake and weigh 9 grams. There is at least one genuine coin and at least one fake. It is known that real coins are to the left of fake coins. How to find all fake coins in two weighings on a balance scale?