

Problem for Week 1

You are given 12 identical looking metal balls and an old-fashioned weighing scale with two baskets. If you place objects in both baskets, the scale can tell you which basket (if either) has heavier contents. You are told that one of the 12 balls is either a little heavier or a little lighter (you don't know which) than the rest. You cannot determine which ball this is by inspection.

Show how to determine which ball is the exceptional one and whether it is lighter or heavier than the rest, by using the scale at most three times.