

# Dutch Mathematical Olympiad 1982

## Second Round

September 17

1. Which is greater:  $17091982!^2$  or  $17091982^{17091982}$ ?
2. In a triangle  $ABC$ ,  $M$  is the midpoint of  $AB$  and  $P$  an arbitrary point on side  $AC$ . Using only a straight edge, construct point  $Q$  on  $BC$  such that  $P$  and  $Q$  are at equal distance from  $CM$ .
3. Five marbles are distributed at a random among seven urns. What is the expected number of urns with exactly one marble?
4. Determine  $\gcd(n^2 + 2, n^3 + 1)$  for  $n = 9^{753}$ .