# MCQ Belief School

Sebastien Destercke

1. If I have $n$ propositional variables, my number of possible focal elements (subsets of interpretations) is

   - ☐ $n$
   - ☐ $2^n$
   - ☐ $n!$
   - ✓ $2^{2^n}$
   - ☐ 42

   → there are $2^n$ assignments of truth values, and each of those corresponds to a singleton. This makes a total of $2^{2^n}$ possible subsets.

2. Which of the following tools/methods is tailored to check whether a knowledge base (set of logical formulas) is consistent?

   - ✓ SAT solvers
   - ☐ Simulated annealing
   - ☐ Navier-Stokes equations
   - ☐ Pizza oven

   → SAT stands for satisfiability (of Boolean formulas)

3. The minimum of a multi-linear function whose variables are constrained to belong to an hyper-cube is obtained

   - ✓ on one of the vertex of the hyper-cube
   - ☐ within the hyper-cube
   - ☐ on the lower bounds of each dimension of the hyper-cube
   - ☐ by sheer luck

   → This number grows exponentially with the number of dimensions, though, so it may still be computationally very intensive. An easier case is when Boolean formulas are monotone, in which case the third answer applies.

4. A particular field of application where one can encounter monotone Boolean functions is

   - ☐ Quantum mechanics
   - ✓ Reliability analysis
   - ☐ French Literature
   - ☐ Non-linear control

   → All others are rather non-linear and non-monotonic (even if some French novels can be quite monotonous). Reliability analysis usually assume coherent systems, meaning that if a component switch from failing to working, the system should not break down.