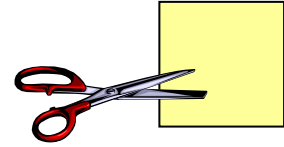
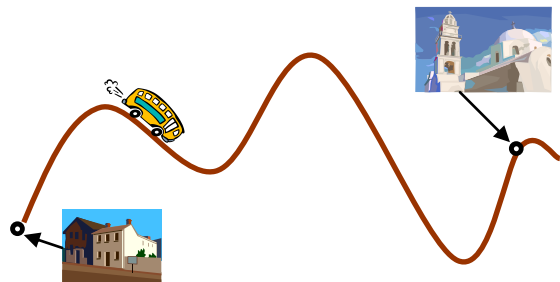


Year 1. Problem Set 3.

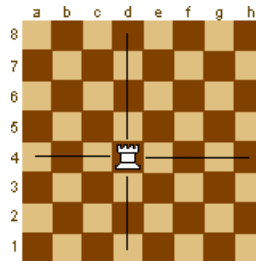
1. Cut a square into a) 10 squares, b) 11 squares.



2. At Krutenian Mountains, all roads go either uphill or downhill. A bus travels uphill with the speed of 30 km/h, and downhill with the speed of 60 km/hour. It is well-known that it takes 6 hours for a bus to get from Candyville to Gingerbreadville and back. Find the distance between these two villages.



3. 51 rooks are placed on the chessboard. Prove that any rook attacks some other rook.



4. What number is bigger: 2^{50} or 31^{10} ?

5. The country Countingtopia has 100 cities. Some of these cities are connected by roads in such a way that no two cities are connected by more than one road. Prove that this country has two cities with equal numbers of roads leading out of them.

