jiguanglaoshi@gmail.com
北京景山学校

I. **The car and the bee :**

The distance between two cities A and B is 120 Km.
A "jet-bee" leaves the city A to go towards B at an average speed of 80 km/h.
A car leaves the city B at an average speed of 40 Km/h, to go towards A.

1.) Find at what distance of A will the bee crash against the window of the car ?

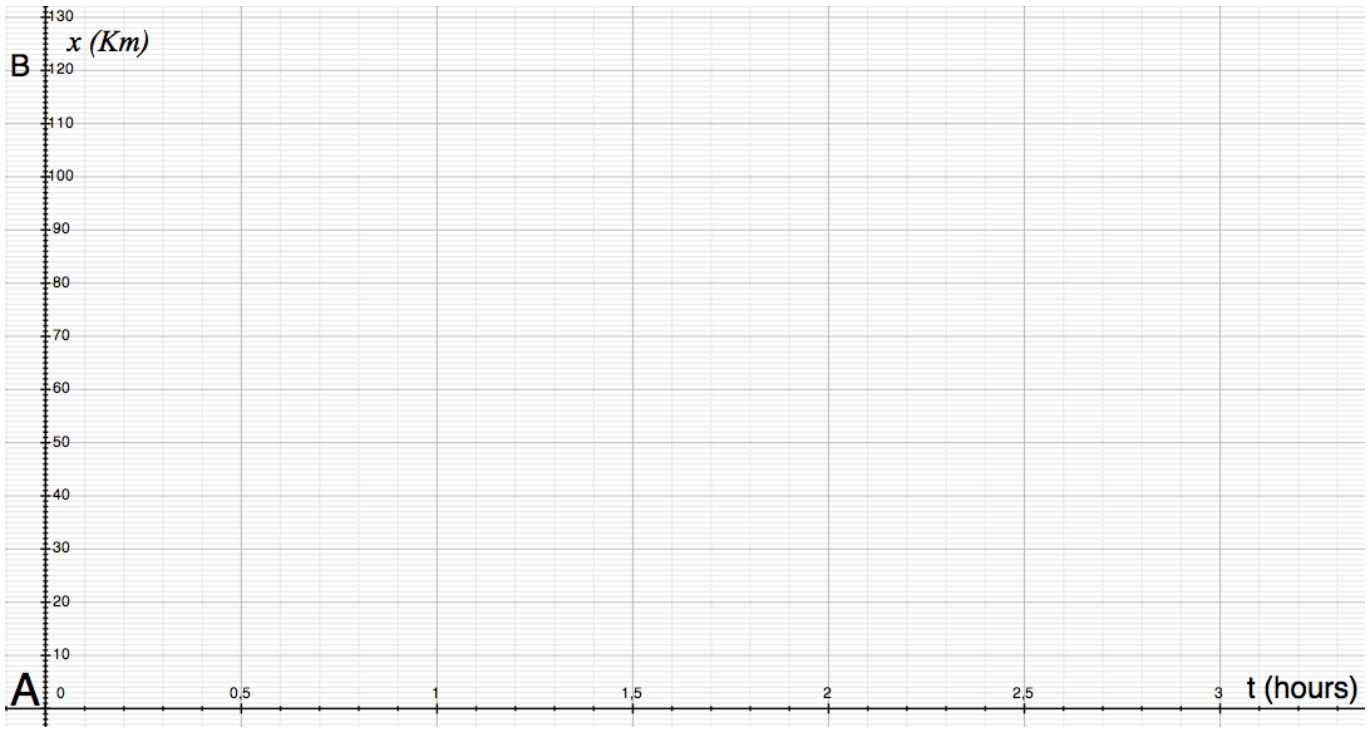
2.) What time will it take before it crashes ?

Explain clearly your answer and draw the graph of the two movements on the chart.

3.) We now suppose that every time the bee hits the car window, it goes back to A and starts again towards B. Then it hits the car window again and goes back and forth indefinitely … until the car reaches A.

What is the distance run by the fly until the car reaches A ?

Explain clearly your answer and draw the graph of the two movements on the chart.



III. **Problem of economics optimization of fitness / Linear Programming.**

Suzy wants to buy two kinds or sweets A and B.
The A kind costs 4 Yuans per Kg, the B kind costs 1Yuan per Kg.
But she cannot spend more than 2 Yuans , and, because she is on diet, she cannot eat more than 1Kg per day.
Let x be the number of Kg for A and y the number of kilograms for B.
The A type produces 0,6 Kcal / Kg, and the B type 0,2 Kcal/Kg.

Question : What is the maximum Kcal that she would consume in these conditions ?

1. Explain (back page) why the constraints are represented by the following system:

$$\begin{cases} x \geq 0\,;\, y \geq 0 \\ 4x + y \leq 2 \\ x + y \leq 1 \end{cases}$$

and Total Kcal : T = 0,6.x + 0,2.y (Kcal)

2. Graph the above inequalities below, and explain (back page) why the maximum Number of Kcal would be obtained for the values of x and y corresponding to the **vertex** of the domain of the allowed consumption.