

Sujet N°18

Please do not write on the exam paper, and do not forget to give it back at the end of the test.

SEQUENCES

A camel problem

Once, in the Sahara, the Bedouins used to cross the desert using camels. Such an animal is able to travel more than twenty days without drinking. In fact, all the water they drink is stored in their bump over their backs. A camel can usually travel 40km per day.



A caravan of twelve camels is leaving on May 15st from Kidal in Mali for Tamanrasset in Algeria. The distance between these two points is 1,078 kilometers. On the first day, the initial weight of each camel is 600 kg. Every day the camels lose one per cent of their weight. During the travel they can't lose more than 25 per cent, otherwise they could die of thirst and dehydration.

Let U_n be the weight of a camel after n days of travel in desert.

1. Calculate the weight of a camel after one, two and three days of travel.
2. Give the relation between U_{n+1} and U_n . What's the nature of the (U_n) sequence?
3. Give an expression of U_n with respect to n .
4. According to you, will the caravan be able to reach its goal?
5. How many liters of water are necessary to restore the initial weight of all the camels?

Vocabulary: to store: stocker
camel: chameau

bump: bosse
with respect to n : en fonction de n