

**BACCALAURÉAT GÉNÉRAL ET TECHNOLOGIQUE
SESSION 2009**

ÉPREUVE SPÉCIFIQUE MENTION « SECTION EUROPÉENNE OU DE LANGUE ORIENTALE »
Académies de Paris-Créteil-Versailles

Binôme : Anglais / Mathématiques

Sujet 10

Interest rates and ratios

The first part of this page is a summary that can be helpful to do the exercise.

If a certain amount of money P is invested at a simple interest rate of $t\%$ per annum, it means that each year the interest is $t\%$ of the original amount of money invested.

If a certain amount of money P is invested at a compound interest of $t\%$ per annum, it means that each year the interest (earned that year) is $t\%$ of the total amount of money (original amount of money plus the cumulated amount of interests) in bank the year before.

Remember that two numbers x_1 and x_2 are in the ratio $a:b$ if (x_1, x_2) and (a, b) are proportional.

Exercise:

Pete won 12, 000 pounds and divided it in the ratio 3:2. He used the larger amount to buy a car, and invested the remainder in a bank. The bank paid a simple interest at a rate of 8% per annum.

1. Suppose that two years later, he sold his car at a loss of 30% and took his money and interest from the bank.
 - a) Compute the amount Pete paid for the car.
 - b) Compute the amount of money he got from selling his car.
 - c) Compute the total amount of money he took from the bank.
 - d) Compute the percentage of the 12, 000 pounds he had left then.
2. Suppose now that the car he has bought loses $t\%$ of its value each year.
 - a) Find t so that after two years, Pete's car is worth only 30% of its original price. Pete thinks the answer is $t = 15$; can you explain to him why he is wrong?
 - b) Suppose that Pete waits another ten years before selling his car and withdrawing his money from the bank. What is the total amount of money he gets after ten years? Was it worth waiting?