

**BACCALAURÉAT GÉNÉRAL
ÉPREUVE SPÉCIFIQUE DES SECTIONS EUROPÉENNES
MATHÉMATIQUES – ANGLAIS**

SUJET 11

STATISTICS

Ce sujet comporte deux pages. L'usage de tout modèle de calculatrice, avec ou sans mode examen, est autorisé.

Pierre de Fermat was a French lawyer and mathematician (1601-1665). Blaise Pascal (1623-1662) was a French mathematician, physicist and religious philosopher.

Blaise Pascal refined the theories of statistics (1660) and with Pierre de Fermat laid the foundation of probability theory. With the rise in statistical thinking, Jacob Bernoulli devised the law of large numbers, which states that as the number of observations increases the actual frequency of an event approaches its theoretical probability.

All these discoveries helped making progresses in medicine. In 1747, the first recorded clinical trial has been done by James Lind, a Royal Navy surgeon. Looking for a cure for scurvy¹, he fed sailors afflicted with scurvy six different treatments and determined that a factor in limes and oranges (vitamin C) cured the disease while other foods did not.

By the start of the twentieth century, medicine had moved from the empirical observation of cases to the scientific application of statistics to determine the best therapies and catalog diagnoses.

Extract from "A brief history of medicine and statistics", Cambridge University Press

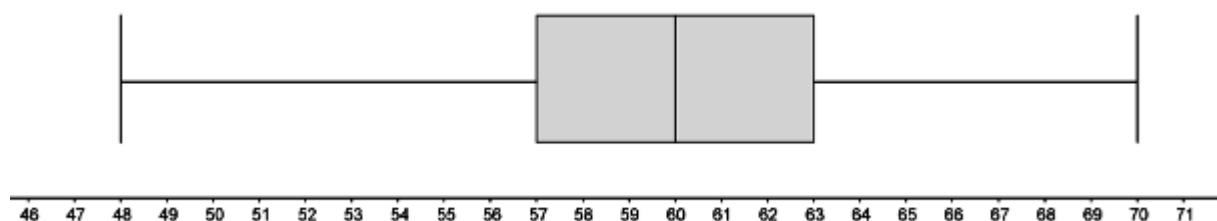
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¹ Scurvy : scorbut.

I. Explain what the text deals with and comment on it.

II. Exercise.

Scientists have done a study on people's heart rate². They obtained this box-plot for people who don't practice any sport:



The data about people who practice sport is :

42 ; 43 ; 46 ; 46 ; 46 ; 48 ; 48 ; 48 ; 48 ; 50 ; 51 ; 51 ; 52 ; 52 ; 52 ; 52 ; 53 ; 53 ; 53 ; 53 ; 53 ; 54 ;
55 ; 55 ; 55 ; 57 ; 59 ; 59 ; 59 . 59.

Scientists want to answer the question:

"Is there any influence of practicing sport on people's heart rate?"

1. How would you answer the question?
2. Draw the box-plot for this data.
3. Conclude.