

**BACCALAURÉAT GENERAL
EPREUVE SPECIFIQUE DES SECTIONS EUROPEENNES
MATHÉMATIQUES – ANGLAIS**

SUJET 19

**Mathematics and golf
Thème : Functions**

Sujet comportant deux pages. L'usage de tout modèle de calculatrice, avec ou sans mode examen est autorisé.

- 4 Golf is a very simple yet complicated game. All you have to do is put the ball in the hole, but for most of us this is harder than it sounds. For someone to know where their shot is going to end up, they must know how to control what the golf ball does after it leaves the clubface.
- 8 The outcomes of the shots are influenced by very slight changes, and understanding the mechanics of golf necessitates the development of mathematical models.
- 8 In a review, Dr. Steve Otto, Director of Research and Testing at The R&A¹, has highlighted some of the ways that mathematics is used to understand golf and determine many of the equipment rules. "*We use applied mathematics on a daily basis, together with physics and engineering*" Dr. Otto told us. "*The use of these tools helps us to ensure that our analysis is thorough and rigorous.*"
- 12 In general, evaluations of golf equipment involve modeling, simulations, and statistics to account for variation in the physical processes involved in hitting a ball with a club.

Adapted from: [https://phys.org/Flight Model of a Golf Ball](https://phys.org/Flight%20Model%20of%20a%20Golf%20Ball), Andrew Werner, March 2007 and [Some applications of mathematics in golf](#), Steve Otto, 2017

1. Explain what the text deals with.

Exercise:

A player hits a golf ball from a small hill. The height h of the ball (in feet) is given by

$h(t) = -6t^2 + 100t + 26$, where t is the time in seconds.

1. Compute $h(0)$. What does this value correspond to?
2. How long will it take for the ball to hit the ground?
3. What is the highest point reached by the ball?

¹ *The Royal and Ancient*: one of the oldest golf clubs in the world, based in St Andrews (Scotland) and considered as the ruling authority of golf throughout the world