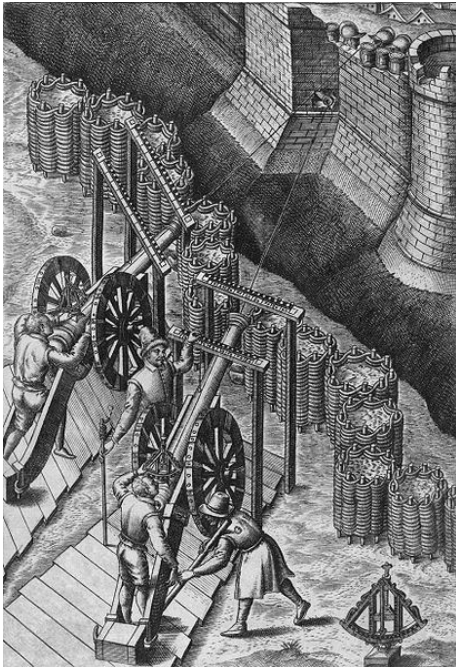


***Epreuve de discipline non linguistique : mathématiques en anglais.*****The Cannonball**

Although gunpowder was known in Europe during the High Middle Ages, it was not until the Late Middle Ages that cannons were widely developed. Let us imagine a siege against a castle.

According to Physics, the path followed by the cannonball is a parabola. The height  $h$  (in feet) of a cannonball depends on the time  $t$  (in seconds) it has been in flight. The relationship between height and time is given by  $h(t) = 40t(4 - t)$ .

**Questions:**

1. What time does the cannonball land on the ground? What is the maximum height of the cannonball?
2. Sketch roughly the graph of function  $h$ .
3. Now our cannon stands on a 30-foot-high hill. Write a new function that describes the path of the cannonball.
4. The relationship between the distance covered and the time elapsed is the following:  
 $x = 600 \times t$ . It is a linear relationship. What is the number 600 in this case?
5. The wall of the castle facing us is 2400 feet away. It is 48 feet high. Using the graph and the linear relationship, say if we will hit or miss the wall.