Ad Meskens on behalf of Uitwiskeling:
The Flemish roots of integration: from Stevin to Sancto Vincentio We associate integration with integrals obtained by a limit of a Riemann sum. In "Beghinselen des waterwichts" (Introduction to hydrostatics) Stevin uses a limiting argument to determine the centres of mass. Thirty years later his fellow townsman Gregorius a Sancto Vincentio S.J. would use a method, in which we can recognize Riemann sums, to determine the surface area under an orthogonal hyperbola. We will analyze their results, indicate why they are not recognized in the history of mathematics as one of the founding fathers of integration and show how and why their methods can be used in secondary mathematics education .

Mariza Krysinska and André Malo (GEM, Groupe d'Enseignement Mathématique):
From Galileo's experiment to the functional model of uniformly accelerated motion
In the workshop, we will propose a didactical path of the functional modelling in the context of the free and rectilinear motion of a ball rolling on an inclined plane. This path will begin with an experiment inspired by the one attributed to Galileo: the aim is to formulate a law of this motion. This law in terms of quantities will be translated into the covariation of time and length in a numerical table. Its regularity will be modelled by an algebraic formula independent of the inclination of the plane. In order to be able to compare motions on planes with different inclinations, this formula will have to be adapted to the conditions of the motions in units independent of the plane's inclination.
De l'expérience de Galilée au modèle mathématique des mouvements uniformément accélérés
Dans l'atelier, on proposera un parcours didactique de la modélisation fonctionnelle dans le contexte du mouvement libre et rectiligne d'une bille sur un plan incliné. Ce parcours débutera par les expérimentations inspirées par celles qui ont été attribuées à Galilée : leur but est de formuler une loi de ce mouvement. Cette loi en termes des grandeurs sera traduite en un tableau numérique de la covariation du temps et de la longueur parcourue. Sa régularité sera modélisée par une formule algébrique indépendante de l'inclinaisons du plan. Pour pouvoir comparer les mouvements sur des plans d'inclinaisons différentes, on devra adapter cette formule aux conditions des mouvements dans des unités indépendantes de l'inclinaison du plan.

Henk Hietbrink (Freudenthal Institute) Solving equations with a perfect compass
The Istanbul Museum for the History of Science and Technology in Islam displays so-called "perfect compasses". They are fascinating instruments that raise many questions, such as how do they rotate on their axes and what do the settings (angles) matter. The usual compass produces circles, the perfect compass can draw all conic sections, even a straight line. Major disadvantage of the instrument is that it is not nearly as user-friendly as the common compass. The inconvenient part is that the end of the compass arm must always be extended or shortened to allow the pencil to touch the paper.
A key claim is that the instrument can solve mathematical equations. In the 19th and 20th centuries, the question was raised whether the device could help solve fourth-degree equations, for example.

As an engineer and mathematics teacher, I address the following questions:
• Can the perfect compass draw all conic sections? Where is the cone and where is the cut?
• Given the settings of the perfect compass, can we apply geometry to predict what the instrument will draw (for example, given the dimensions of the device and the angle settings what will be the position of the foci and the length of the long axis and the short axis)?
• Given the properties of the ellipse (i.e., the position of the foci and the lengths of the long and short axes), can we use geometry to predict what the corresponding settings for the instrument should be to produce that conic section?

In the workshop, your experiments and investigations will provide the answers.