

About the Cover

x , y , and z

This month's cover was suggested by the review in this issue of the book *Enlightening Symbols* by Joseph Mazur. As Mazur mentions, albeit rather casually, it was Descartes who introduced into mathematics one of the most enduring conventions of our subject—the use of a , b , c , etc. as constants and x , y , z , etc. as variables. The cover image shows page 303 from the first edition of *Discours de la méthode*, in which this convention apparently first came fully to life.

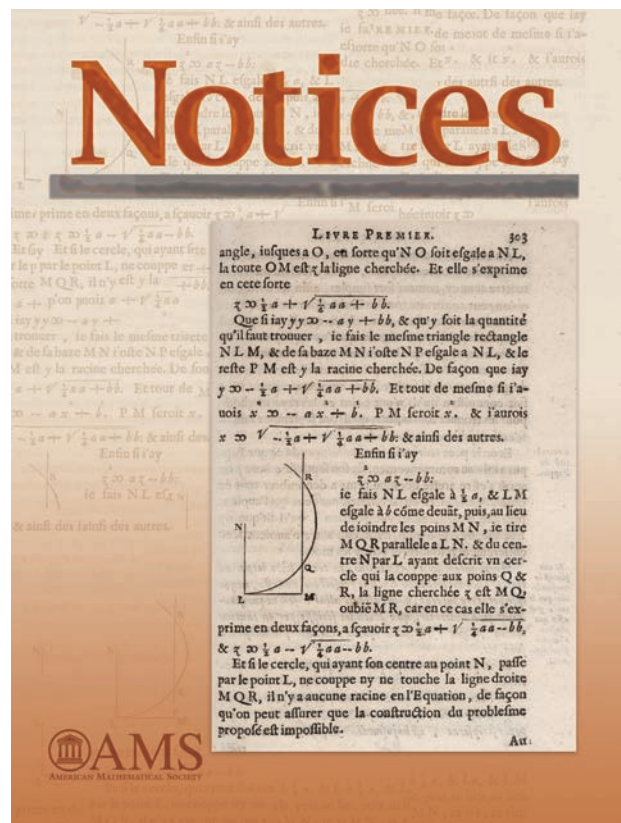
The *Discours* illustrates a curious feature of the history of mathematics—that randomness has played a more important role than one might expect. First of all, the circumstances of its publication are strange. It appeared in 1637, and in French, but not in France. Descartes had been having some trouble with French authorities, and the Netherlands was much more liberal in publishing policies. It was published in Leiden.

That it was in French seems quite reasonable to us, but in its time there were few scientific works in that language. Descartes himself asserts somewhere that he wrote in French because he wanted a wider readership. This is not a plausible claim. There is evidence that Descartes's Latin was rather weak, but he was a rather vain man ... In fact it wasn't until René van Schooten the Younger published a Latin translation that it became widely read. It was the Latin edition, for example, that was Newton's textbook. What if van Schooten's father had not been a good friend of Descartes?

Descartes's choice of letters was one segment in the history of conventions regarding variables in algebra. Other major characters in the story are Viète and Harriot. Harriot himself was responsible for a few enduring conventions in algebra, among them the choice of n for integer variables. But it was Descartes who introduced exponents, so that (if we remember correctly), Harriot wrote $nnnnnnnnnnnnnnnnnnnn$, where we follow Descartes in writing n^{19} . How did Harriot miss this?

The question of enduring conventions is intriguing. What intuition led Descartes to his apparently canonical choice? Might history have taken some different path? Descartes's own conventions did not always pass the test. He is deservedly famous for devising the geometric interpretation of algebra, but it was Newton who rotated Descartes's axes so as to agree with our modern convention that the dependent variable is plotted vertically. Somehow, this seems to us, as to Newton's contemporaries, exactly right. Why?

The bilingual French/English edition of *La Géométrie*, which is part of the *Discours*, is available at archive.org/details/geometryofrene00desc.



The cover image was supplied from a copy of the *Discours* now in the Thomas Fisher Rare Book Library at the University of Toronto, to whom we are very grateful.

—Bill Casselman
Graphics Editor
notices-covers@ams.org