



# Foundations of Game Engine Development, Volume 1: Mathematics

By Eric Lengyel

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The first volume of *Foundations of Game Engine Development* discusses the mathematics needed by engineers who work on games or other types of virtual simulations. The book begins with conventional treatments of topics such as linear algebra, transforms, and geometry. Then, it introduces Grassmann algebra and geometric algebra to provide a much deeper understanding of the subject matter and highlight the places where traditional arithmetic with vectors, matrices, quaternions, etc., isn't quite correct. Includes exercises.

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  - 1.2.2 Addition and Subtraction
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