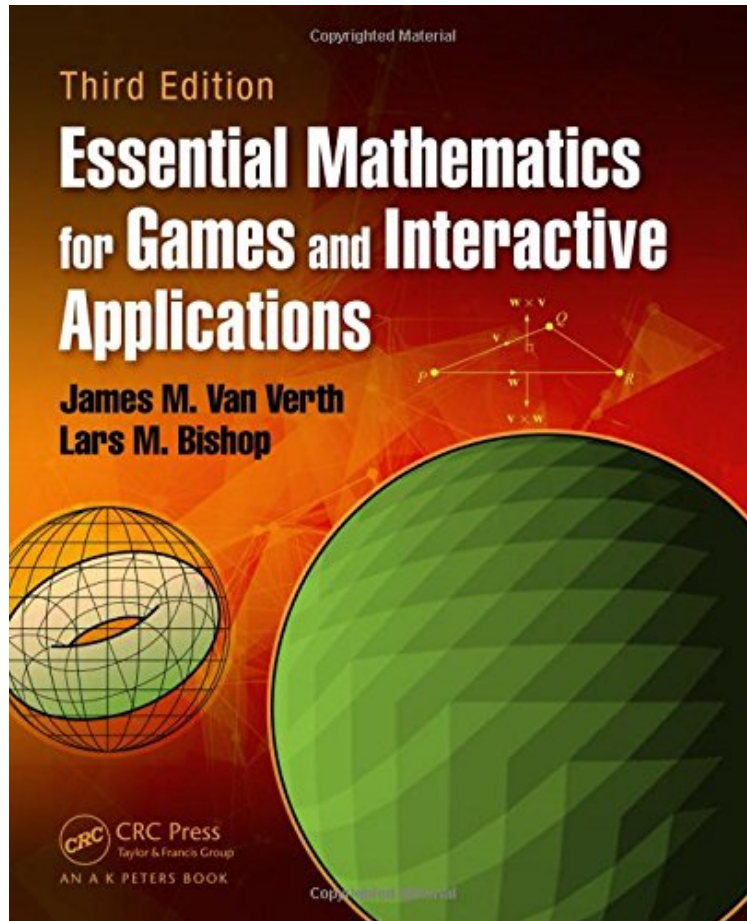


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Essential Mathematics for Games and Interactive Applications, Third Edition

James M. Van Verth, Lars M. Bishop
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James M. Van Verth, Lars M. Bishop : Essential Mathematics for Games and Interactive Applications, Third Edition before purchasing it in order to gage whether or not it would be worth my time, and all praised Essential Mathematics for Games and Interactive Applications, Third Edition:

0 of 0 people found the following review helpful. Great review of the math required to build interactive 3D ...By A. EassaGreat review of the math required to build interactive 3D applications. Explanations were solid and the writing style is engaging without getting too informal.My only suggestion to the authors would be to, in a fourth edition, include exercises at the end of each chapter to make it more suitable as a pedagogical tool.0 of 2 people found the following review helpful. Five StarsBy Ivan Dawniok!8 of 8 people found the following review helpful. An Almost Flawless Book! Lots of Stuff Covered From Math to Graphics to Physics. Highly Recommended.By A. M. HernandezEssential Mathematics for Games and Interactive Applications by James M. Van Verth and Lars M. Bishop is a quality math book if I ever saw one. Strangely, the first edition came out in 2004 but the book was kind of off my

radar until recently. This third edition was published in 2015 and seems very current. The authors here do a great job of explaining the material properly. I felt like they created a great foundation for learning these complex ideas and I appreciated the quality and readability of the code samples. The book starts with an overview of computer number representations, and goes into detail with the IEEE 754 floating-point standard. At first I assumed this was unnecessary detail, but actually its pretty useful to understand and a good base to build on. They continue with vectors and points, linear transformations and matrices, affine transformations, orientation (including matrices, Euler angles, axis-angle, and quaternions), and interpolation (linear and curved). In the next section they transition to more graphic oriented topics such as: viewing and projection, geometry and programmable shading, lighting, rasterization, then a random chapter on random numbers, and finish off with intersection testing and rigid-body dynamics. Just looking at the table of contents is sometimes not enough to get a feel for the quality of the text, so I will reveal more. The beginning parts are really exactly what youd expect for a game math book. The basics of vectors, matrices, quaternions, etc. are the bread and butter for a 3D programmer. The coverage here is solid and great for a beginner. Advanced readers may not find any surprises, but its still a good refresher. The interpolation chapter I found interesting, especially the detail into different types of curves and splines . This could be immediately useful for coding a skinned character or animating a camera in a game. Viewing and projection were given adequate coverage and are essential to anyone wishing to code a graphics engine themselves. The next chapter was particularly long and explained the programmable shader pipeline to great effect. The authors explained everything from color representation, vertex attributes, drawing geometry, fixed-function versus programmable, vertex and fragment shaders (aka pixel shaders), and texture mapping. Really a great introduction for anyone wanting to learn to code shaders themselves. Then they move onto lighting and go into the basic types (point, spot, directional, and ambient), surface materials, per-vertex and per-fragment lighting, combining with textures, and a few small sections of more advanced topics like normal mapping, physically based lighting, HDR, and deferred shading. Next up is rasterization, which was an awesome chapter that explained (in epic detail) how rasterizers work which I feel does help when you know whats going on behind the scenes. I dont know of many other books that explain this part of the pipeline so well, so this was much appreciated. The random number chapter was also quite informative. Its easy to just call a function that spits out a number and not actually understand whats happening. I found this portion of the book to be a nice surprise. Intersection testing was covered near the end, and it was one of the longer chapters. Almost anything you could think of was here: finding distances from lines and points, sphere/ray/plane intersections, axis-aligned bounding boxes (AABBs), swept spheres, object-oriented boxes, triangle intersection, and a simple collision system. Finally the book closes with a chapter on rigid-body dynamics. I actually purchased my copy mostly for the rigid-body material and I felt I learned a few useful things. Of course, it was only one chapter but some of the explanation was better than whole books Ive read on physics. Certainly it gave me a few things to research further, and I appreciate that. Overall I would say that Essential Mathematics for Games and Interactive Applications is an almost flawless textbook. I may be a great place to start for a beginner, and even intermediate to advanced readers may learn a thing or two. Some of the other game math books I recommend I read so long ago its hard to make a direct comparison. But this title is certainly up there with the best. I would wholeheartedly recommend.

Expert Guidance on the Math Needed for 3D Game Programming Developed from the authors popular Game Developers Conference (GDC) tutorial, Essential Mathematics for Games and Interactive Applications, Third Edition illustrates the importance of mathematics in 3D programming. It shows you how to properly animate, simulate, and render scenes and discusses the mathematics behind the processes. New to the Third Edition Completely revised to fix errors and make the content flow better, this third edition reflects the increased use of shader graphics pipelines, such as in DirectX 11, OpenGL ES (GLES), and the OpenGL Core Profile. It also updates the material on real-time graphics with coverage of more realistic materials and lighting. The Foundation for Successful 3D Programming The book covers the low-level mathematical and geometric representations and algorithms that are the core of any game engine. It also explores all the stages of the rendering pipeline. The authors explain how to represent, transform, view, and animate geometry. They then focus on visual matters, specifically the representation, computation, and use of color. They also address randomness, intersecting geometric entities, and physical simulation. An Introduction to Creating Real and Active Virtual Worlds This updated book provides you with a conceptual understanding of the mathematics needed to create 3D games as well as a practical understanding of how these mathematical bases actually apply to games and graphics. It not only includes the theoretical mathematical background but also incorporates many examples of how the concepts are used to affect how a game looks and plays. Web Resource A supplementary website contains a collection of source code, supporting libraries, and interactive demonstrations that illustrate the concepts and enable you to experiment with animation and simulation applications. The site also includes slides and notes from the authors GDC tutorials.

Praise for Previous Editions: "Its the book with all the math you need for games." Neil Kirby, Researcher, Alcatel-Lucent "Even though Ive worked with these systems for years, this book showed me new ways of looking at several

topics that make them easier to remember and use. For someone new to 3D programming, it is extremely useful it gives them a solid background in pretty much every area they need to understand." Peter Lipson, Toys for Bob, Inc.

About the Author James M. Van Verth is a software engineer at Google, where he works on GPU support for the Skia 2D Graphics Library. He has worked for Insomniac Games, NVIDIA, and Red Storm Entertainment and, for the past 17 years, he has been a regular speaker at GDC, teaching the tutorials "Math for Game Programmers" and "Physics for Game Programmers." He received a BA in math/computer science from Dartmouth College, an MS in computer science from the State University of New York at Buffalo, and an MS in computer science from the University of North Carolina at Chapel Hill.

Lars M. Bishop is an engineer in the Handheld Developer Technologies group at NVIDIA. Prior to joining NVIDIA, he was the chief technology officer at Numerical Design Limited, leading the development of the Gamebryo3D cross-platform game engine. He received a BS in math/computer science from Brown University and an MS in computer science from the University of North Carolina at Chapel Hill.