**1. Matrix effect Sequence - 23 Math for Game Developers - Prop Positioning (TRS Matrices)**

number 1:Scaling

number 2:Rotation

number 3:Translation

But take it to equation, it become: Translation \* Rotation \* Scaling \* V

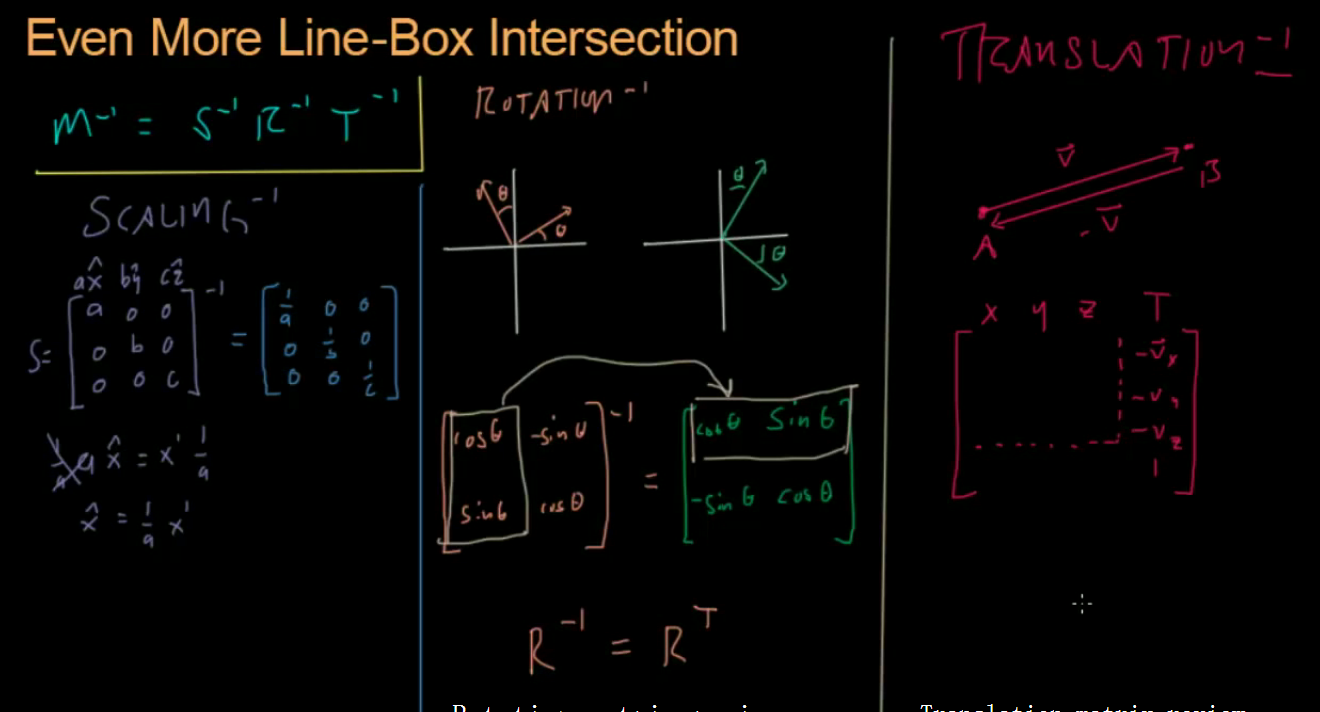
Because the one nearest to the v will first make effect.

**2. inverse matrix - 24-25 Updated Bullet Collisions (Coordinate Systems)**

Inverse matrx can do the revert operation of a matrix

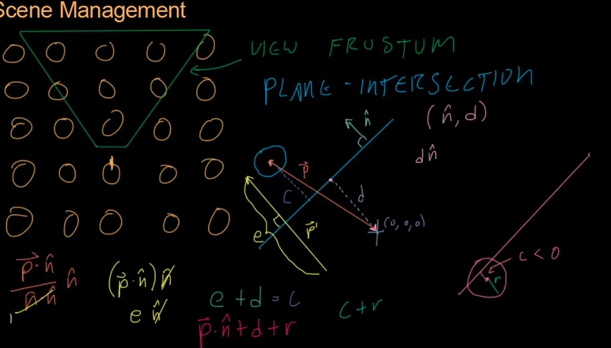
make intersection between no-algin AABB and a line, you can transform line to the local coordinate system of AABB

These tutorial also teach you how to get inverse matrix



3. View Frustum Cull - Math for Game Developers - Frustum Culling

Jude by the side of 6 plane.



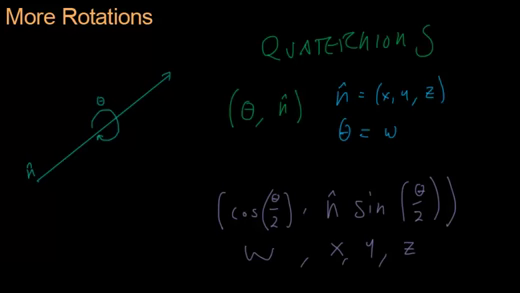
4. merge sort - Code for Game Developers - Drawing Transparent Characters (Mergesort)

For faster index rendering entities.

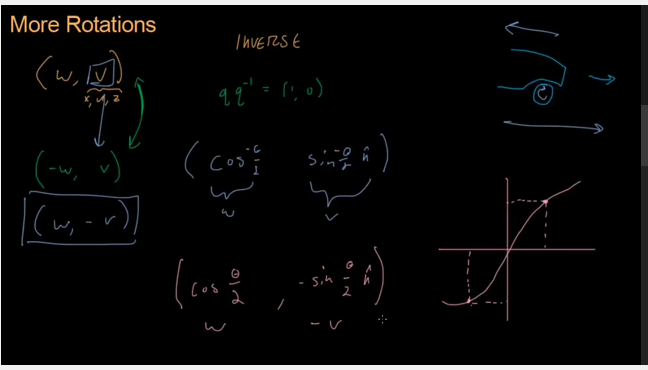
5. Quaternion – 31 Math for Game Developers - Rotation Quaternions

The purpose is to rotate by different axis together.

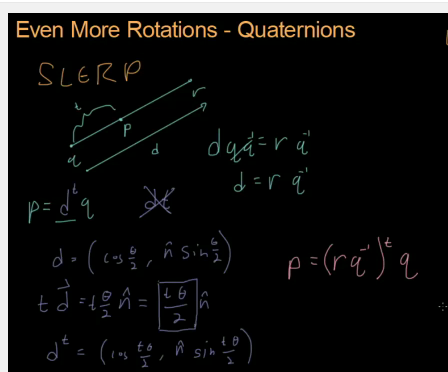
The equation from angle, axis vector to quatenion:



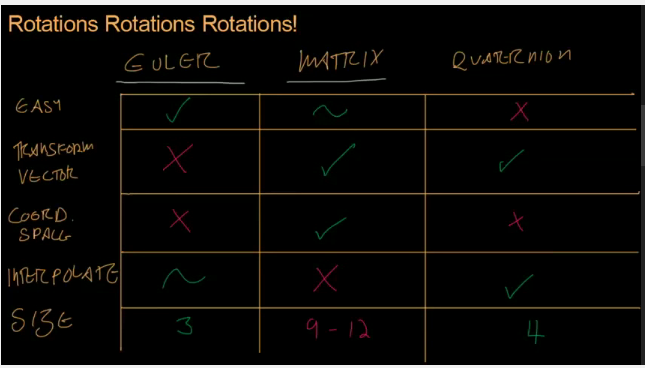
6. How to get inverse quaternion. – 32 Math for Game Developers - Quaternion Inverse



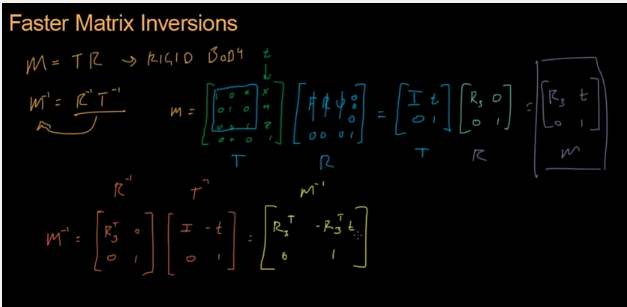
7. Quaternion liner interpolation



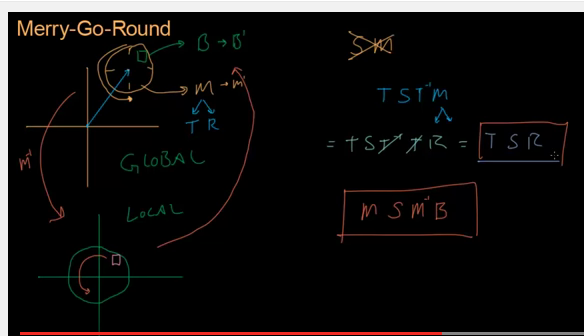
8. Compare Euler, Matrix and Quaternion rotation.



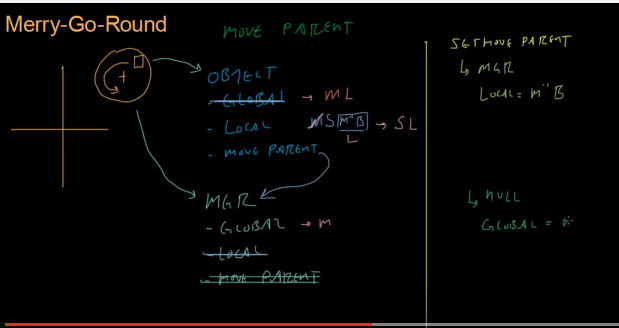
9. Faster Matrix Inversion – without scaling



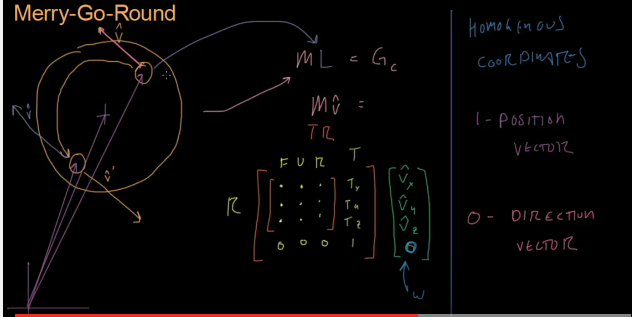
10. Object rotate in local coordinate – 40 Math for Game Developers - Merry-Go-Round (Matrix Transformations)



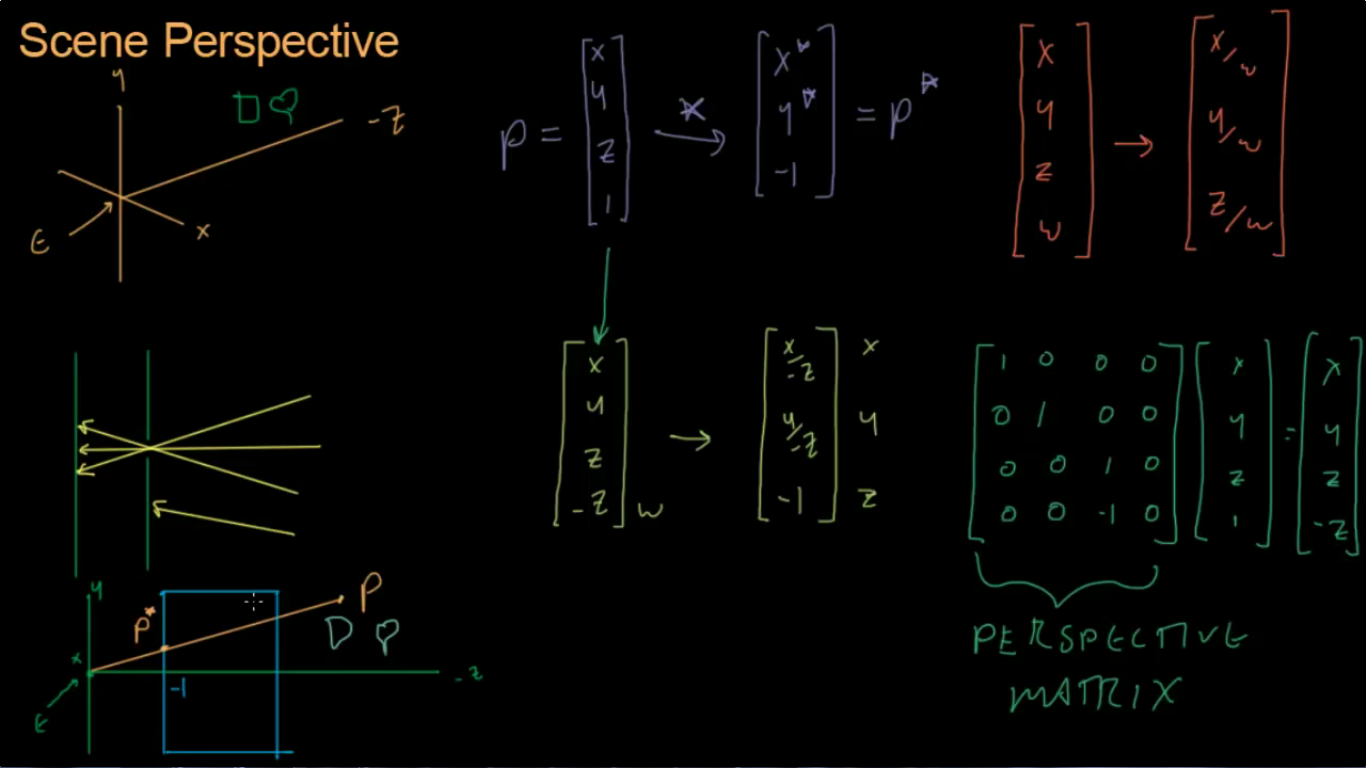
11. move parent – 40 Code for Game Developers - Move Parents



12. rotate vector – 41 Math for Game Developers - Homogenous Coordinates



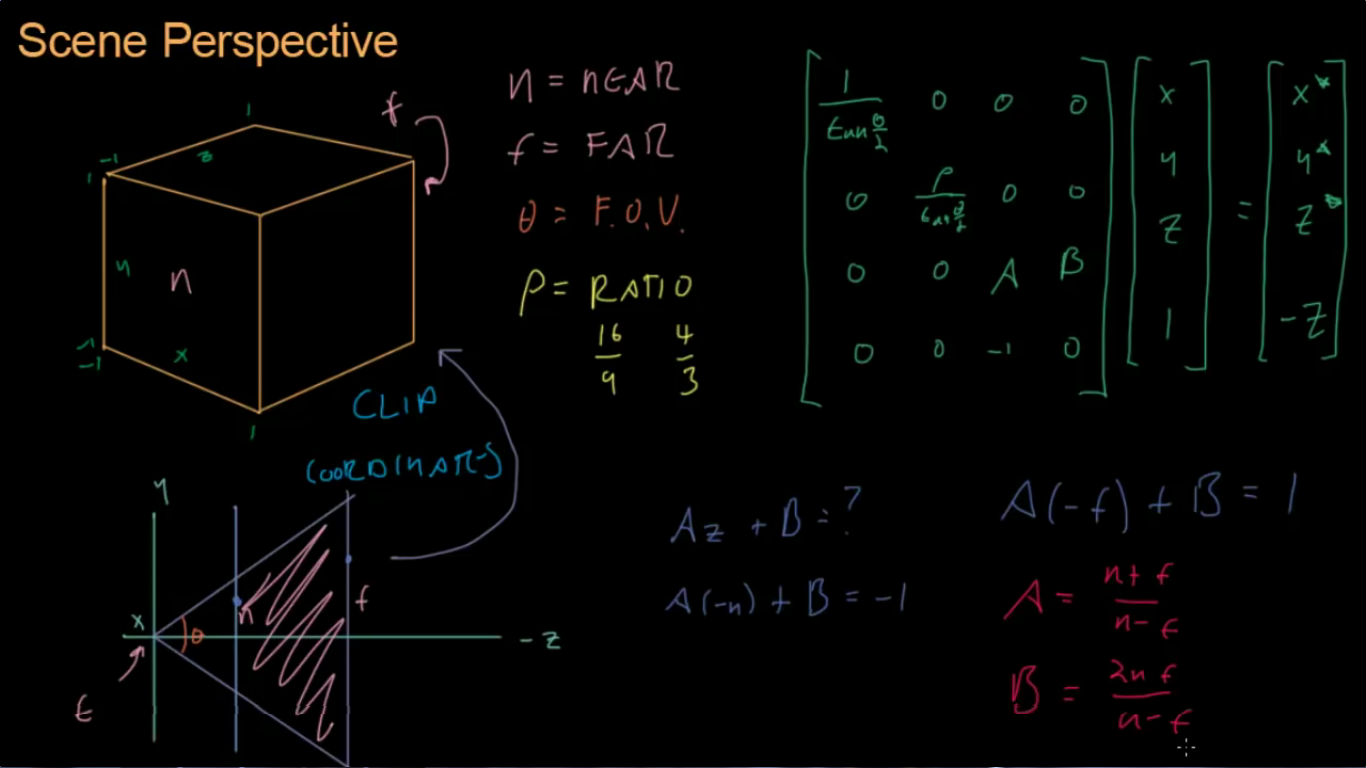
13. Perspective matrix part1 (project to a plane) – 42. Math for Game Developers - Perspective Matrix



14. Perspective matrix part2 – 43 Math for Game Developers - Perspective Matrix Part 2

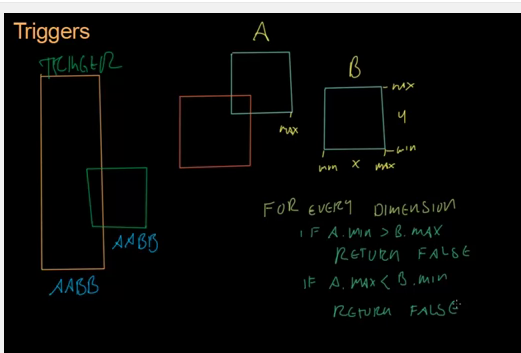
Project object from near and far plane to a cube area

Clip Coordinate

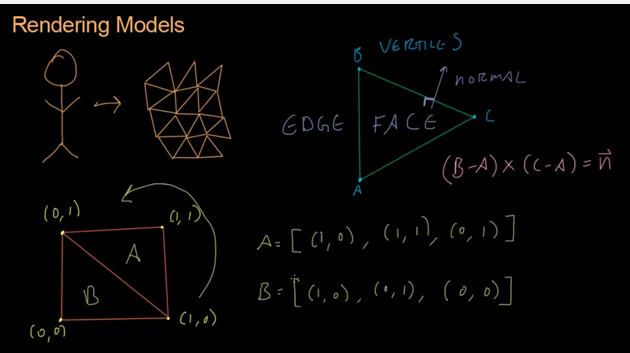


15.AABB intersection - Math for Game Developers - Trigger Areas (AABB Intersection)

If all dimension overlap, the two AABBS intersected.

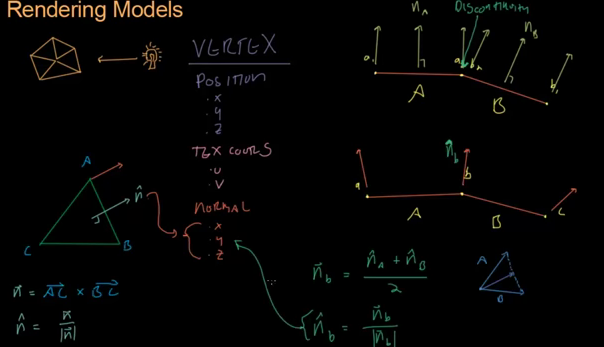


16. Rending models – 45 Math for Game Developers - Triangle Meshes

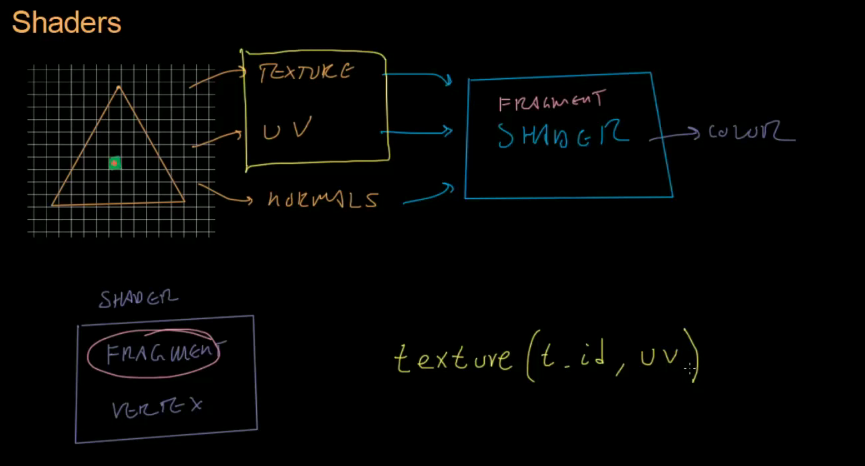


17. The normal of vertex in triangle – 50 Math for Game Developers - Triangle Mesh Normals

It is the average normal of adjoining triangle.



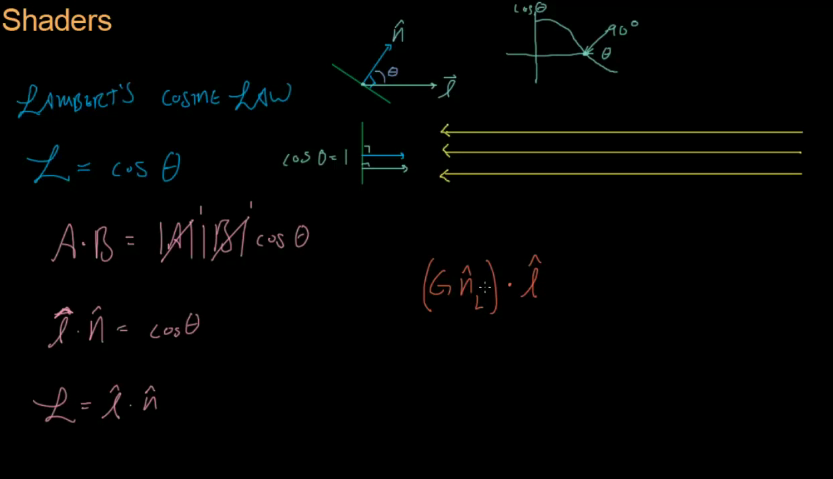
18. Shaders – 54 Math for Game Developers - Fragment Shaders



19. First shading program –Math for Game Developers - Lambertian Surfaces

Introduce the basic lighting model (Cosine Law) in fragment shader.

Use RemapVal function to reduce the contrast.



20. Normal map – 52 Math for Game Developers - Normal Maps

