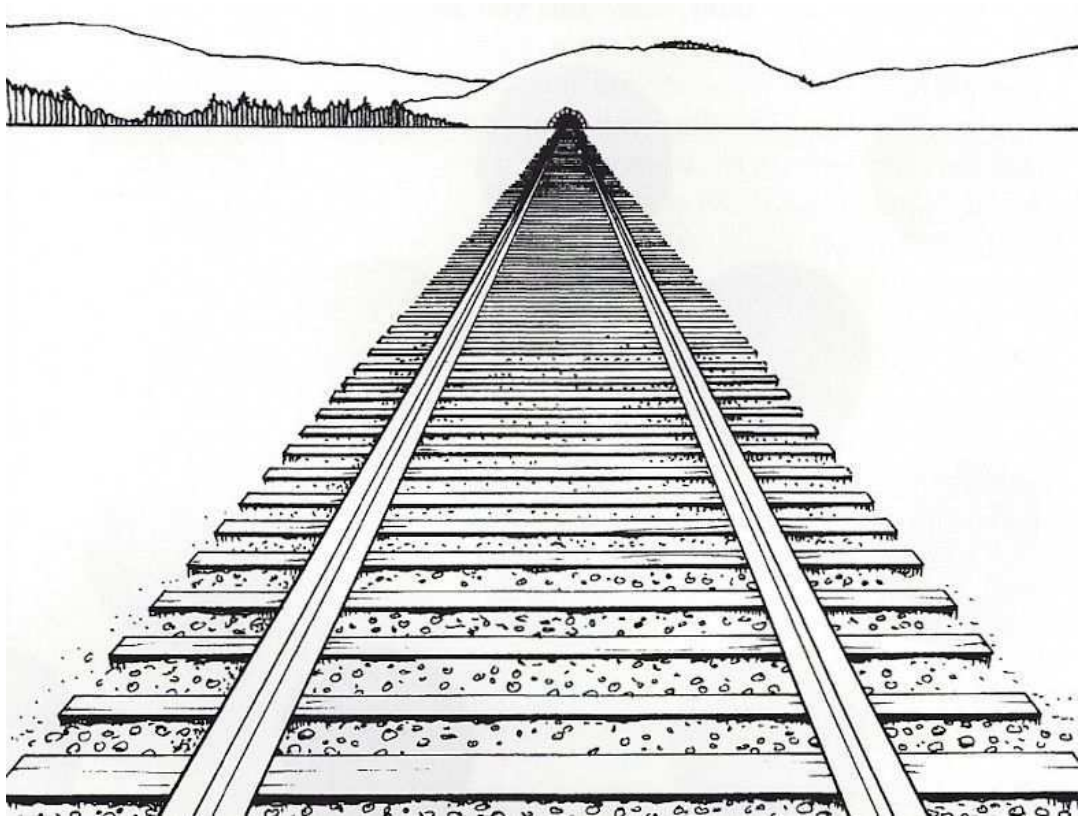
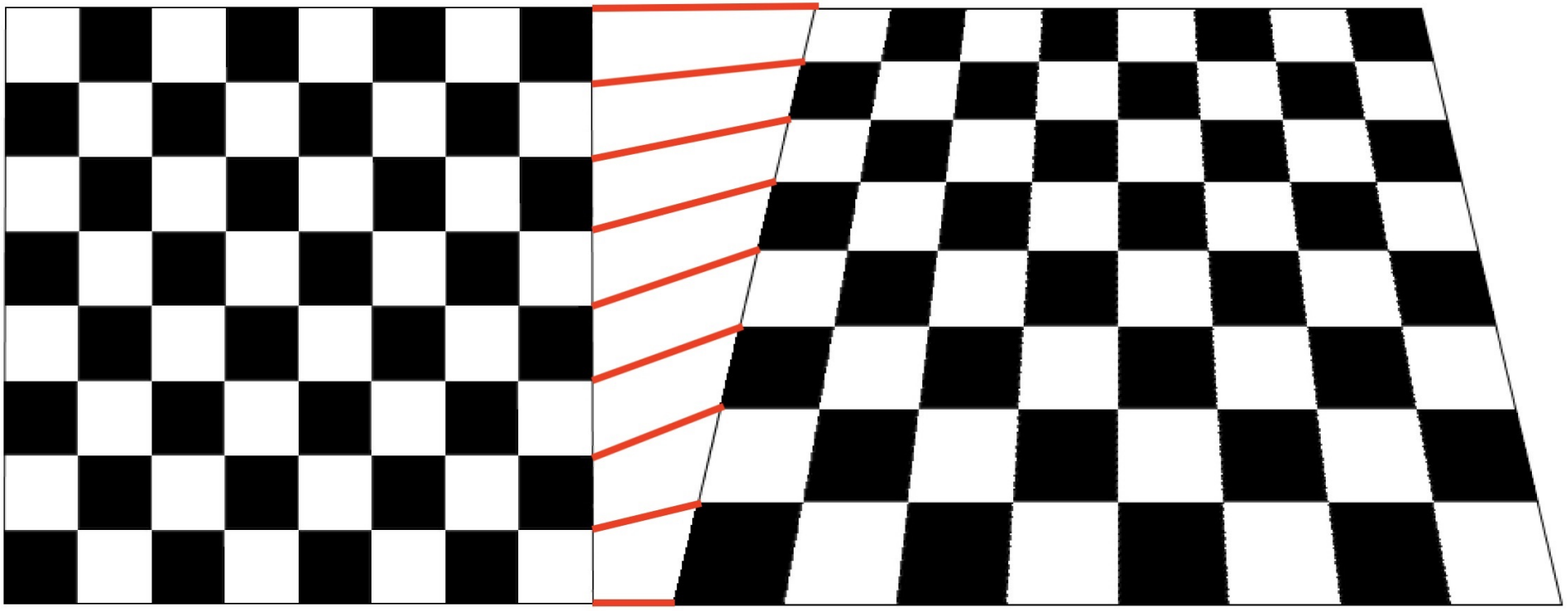
Texture Mapping Problem

There is a problem texture mapping in 3D...

Due to perspective, interpolation is NOT linear !



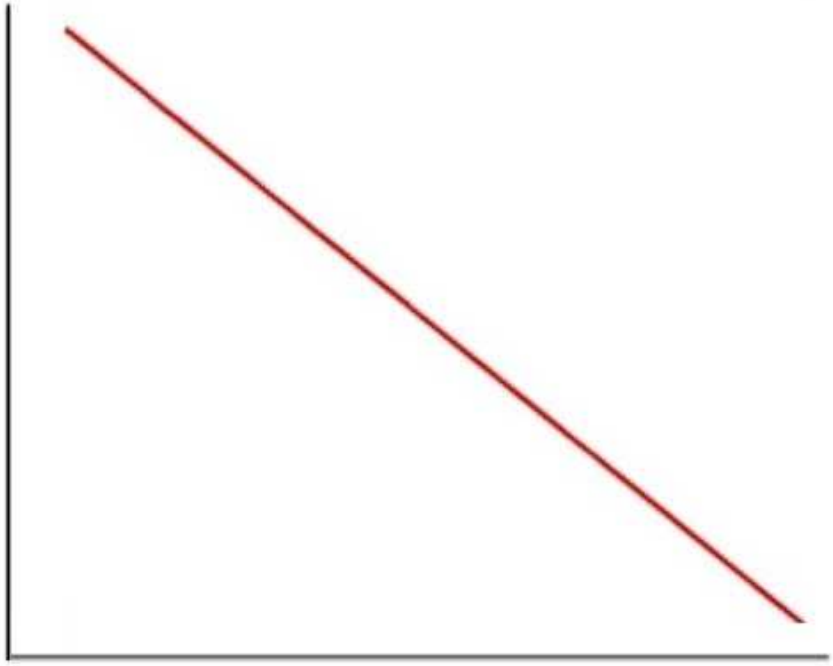
Classic Textbook Illustration

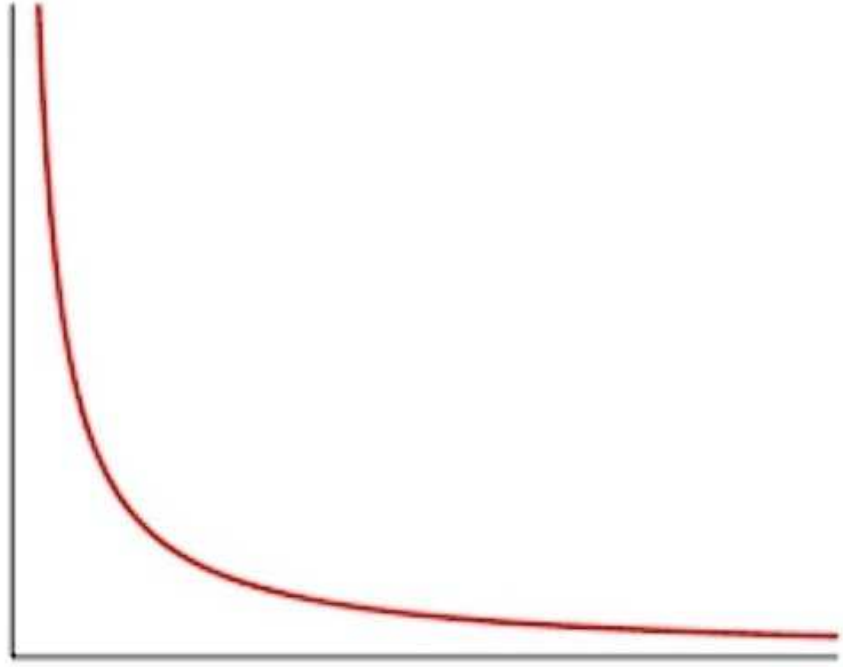


So what kind of function ?

Function takes the form of 1/z (rather than z)

Allows us to stretch texture off into infinity





Perspective Correction Formula

Z_0 is the Z depth of furthest vertex from the camera

Z_1 is the Z depth of closest vertex to the camera

C_0 is texture y coord of furthest point from camera

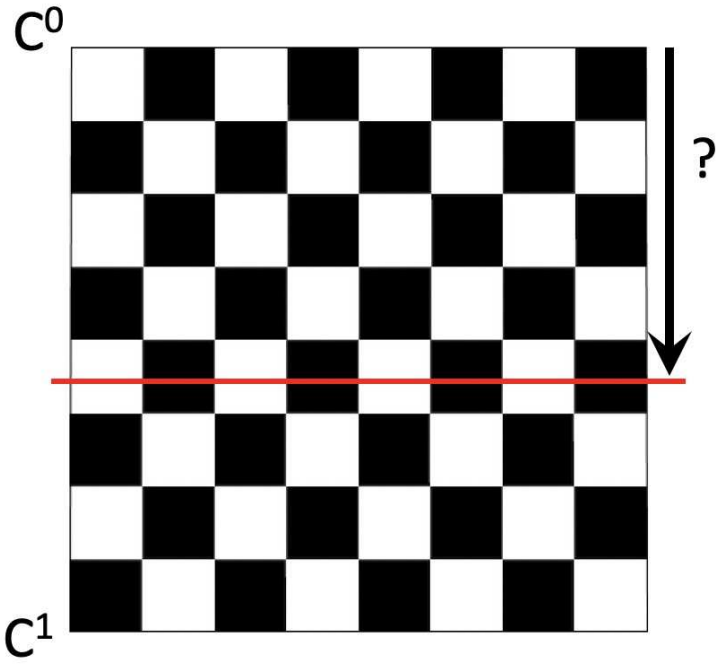
C_1 is texture y coord of closest point to camera

q is distance of rake row we have got to from the top

C is the row of the texture image we should use

$$C = \frac{\frac{C_0}{Z_0}(1-q) + \frac{C_1}{Z_1}q}{\frac{1}{Z_0}(1-q) + \frac{1}{Z_1}q}$$

Position of Elements



Texture

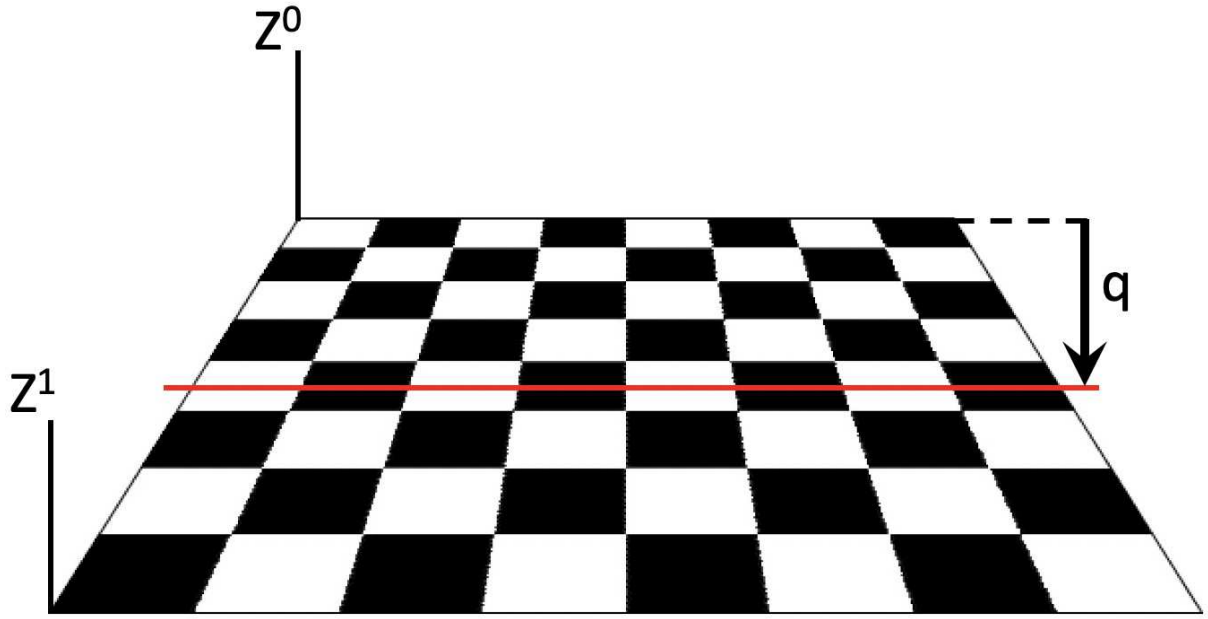


Image Plane Rendering

Warning !

This is fairly complex stuff
Don't expect to understand it immediately

The code implementation of this is pretty ugly:
- Plenty of variables with short names
- Long lines of mathematics, with lots of brackets !

You'll probably need to spend time exploring it
And reading some additional material about it...

Perspective Correction Derivation

For those of you who are interested...
Scratch-a-pixel provides a derivation of this

It's a very long URL:
sic-rendering/rasterization-practical-implementation/perspe

Probably best just to google:

`scratchapixel perspective correct`