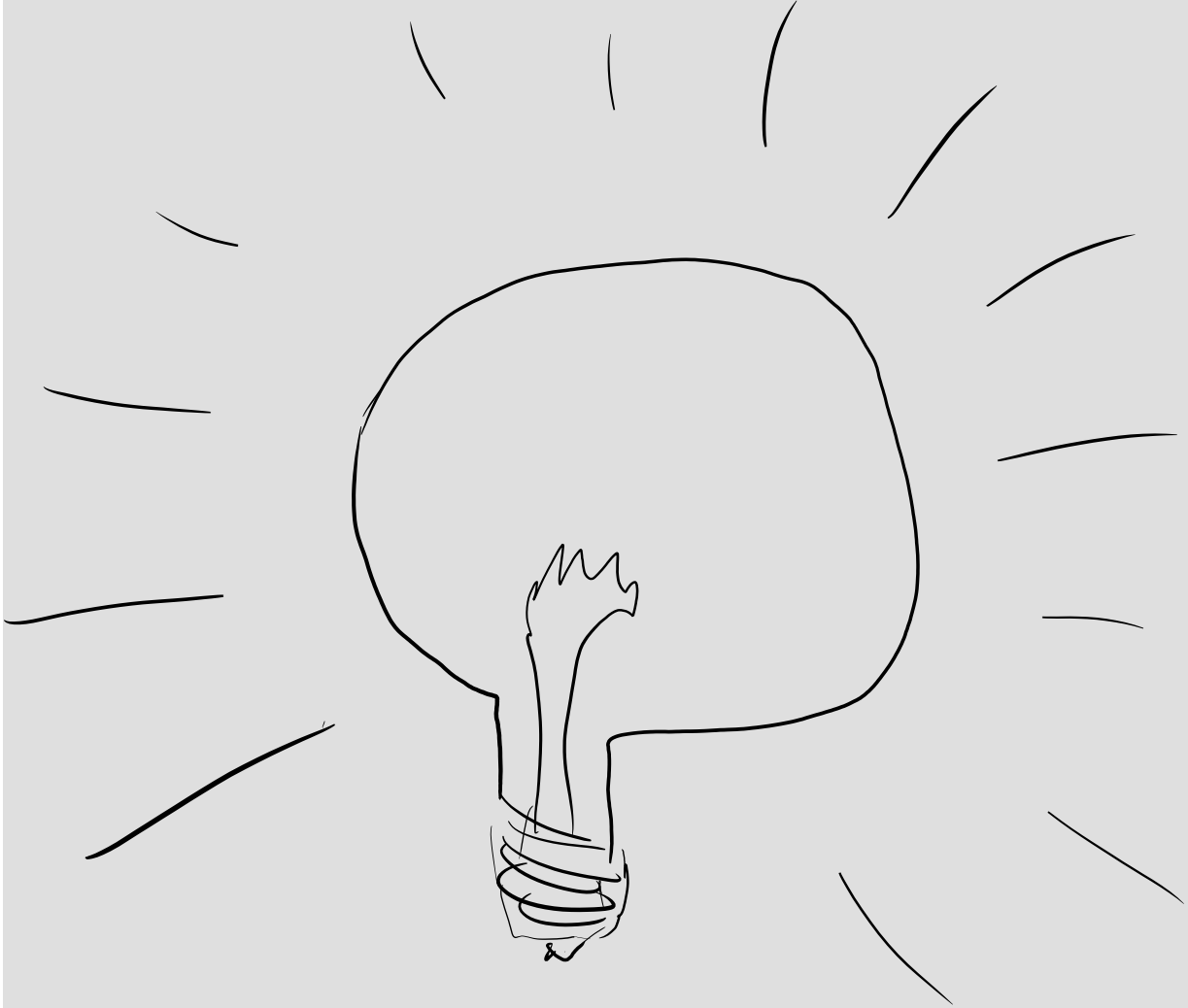
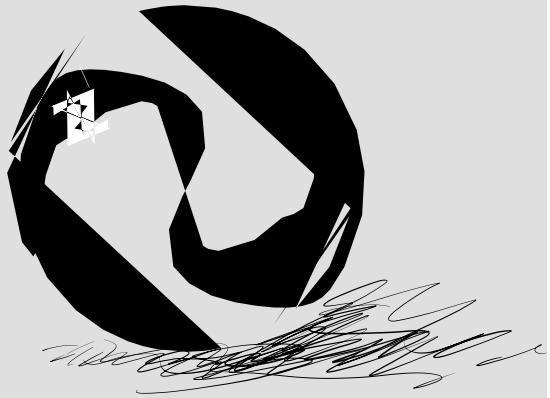
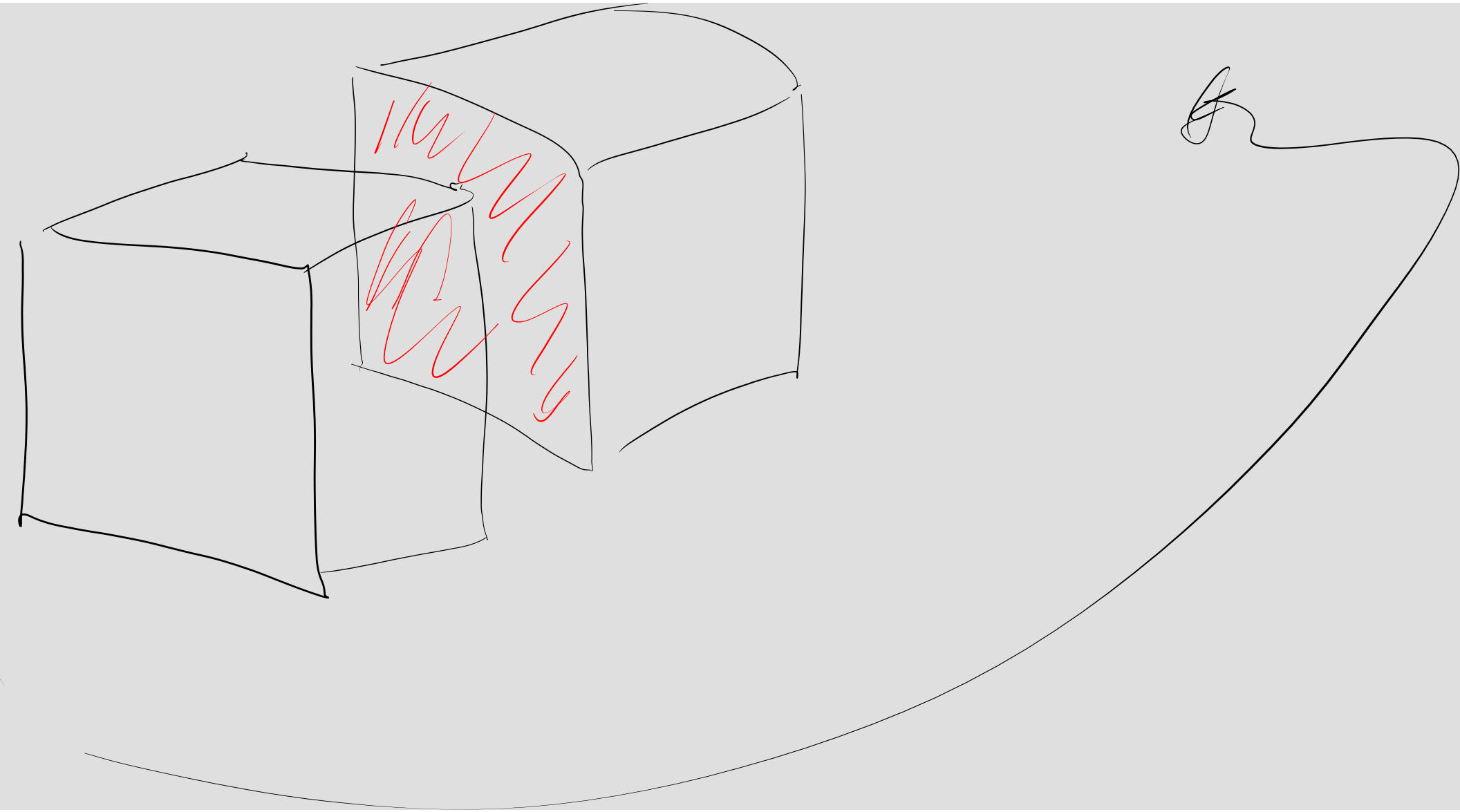
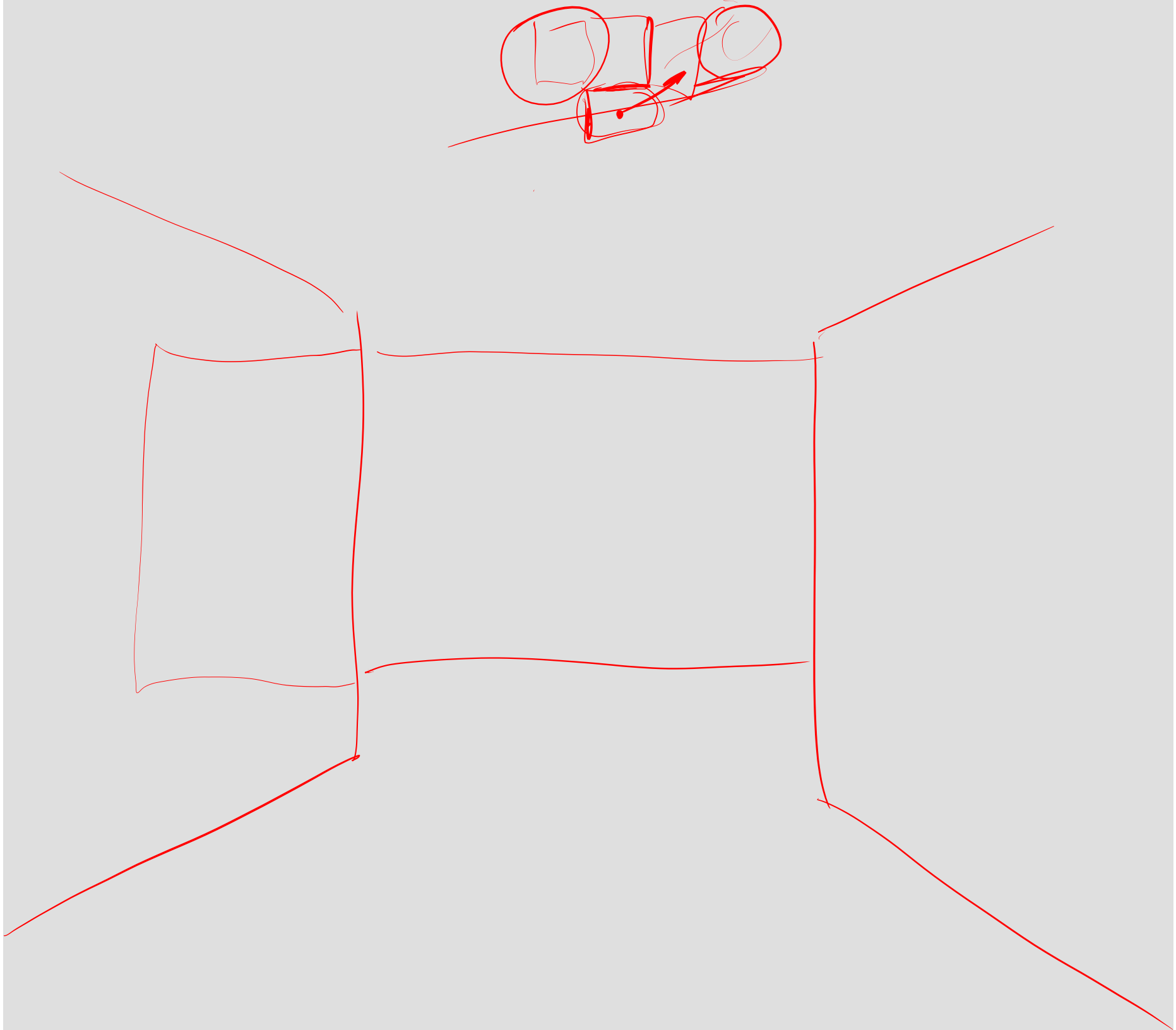
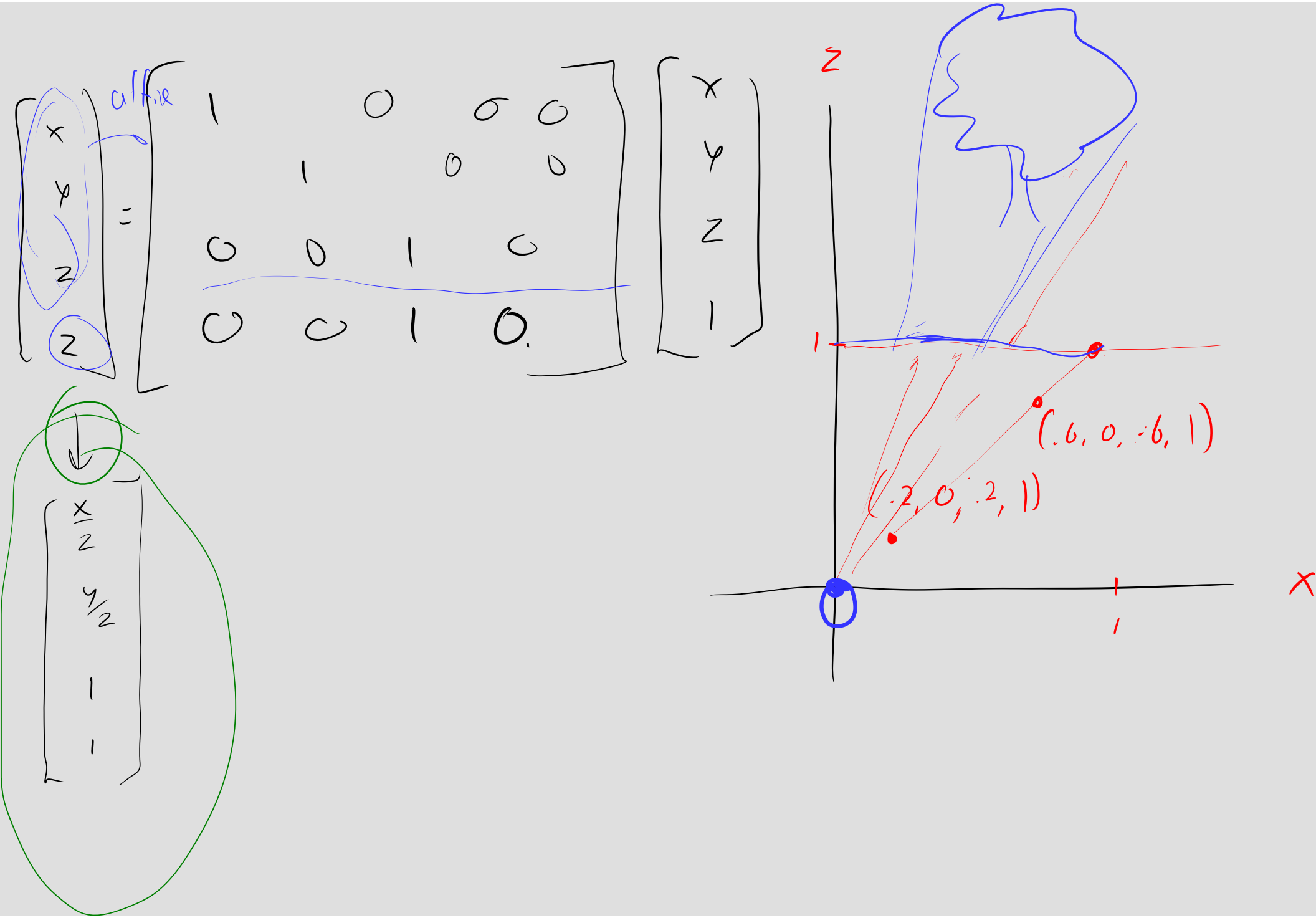
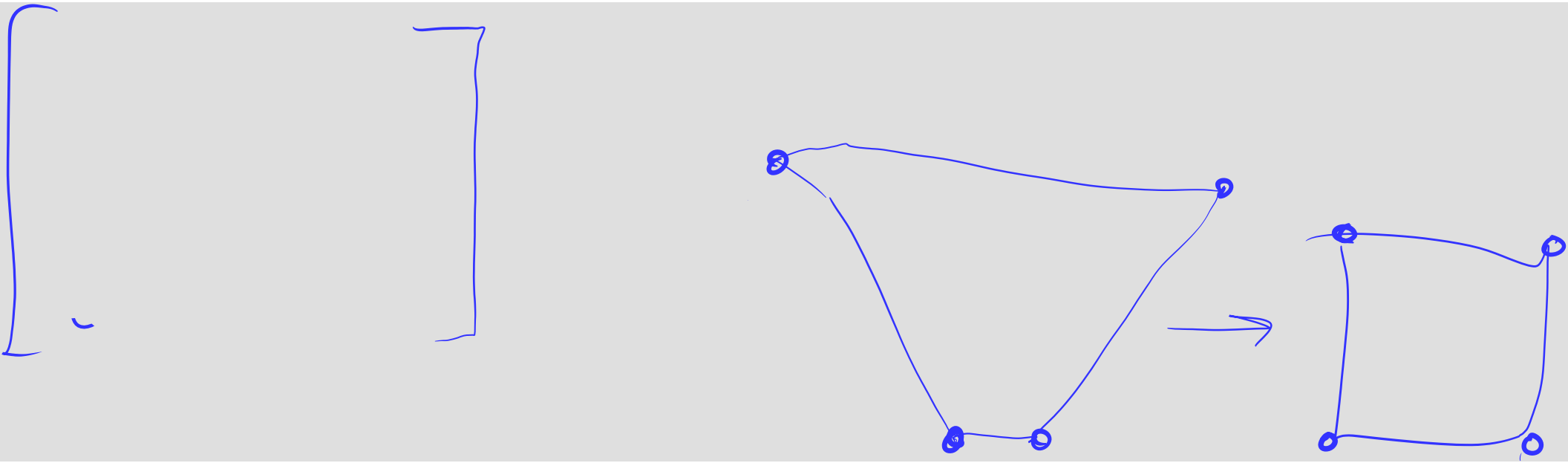


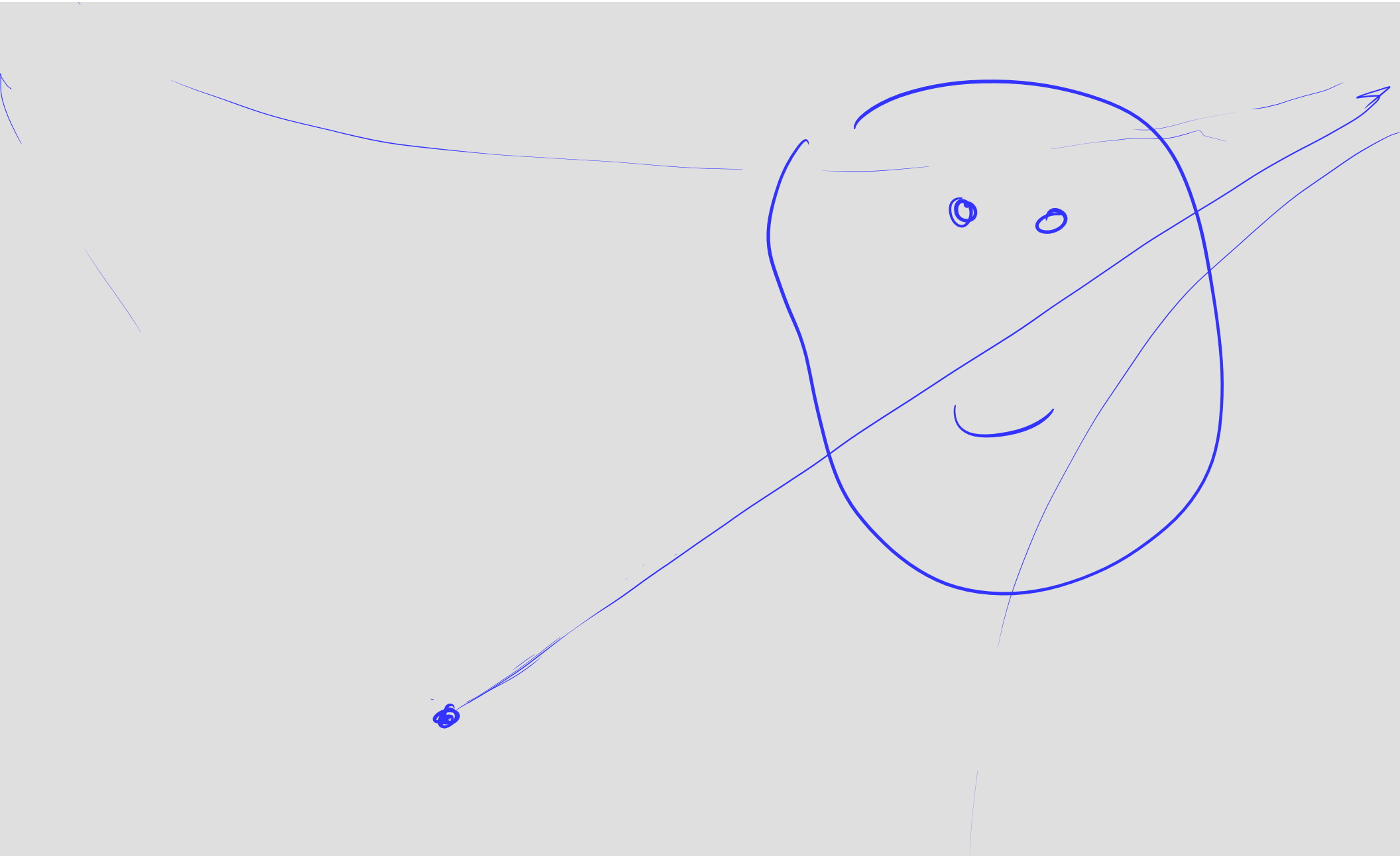







affine
x
y
z
w
=
1 0 0 0
0 1 0 0
0 0 1 0
0 0 1 0
x
y
z
1
x/w
y/w
1
1
z
1
(.6, 0, -.6, 1)
(.2, 0, .2, 1)
1
1
x





$$\begin{bmatrix} x \\ y \\ z \\ w \end{bmatrix} = \begin{bmatrix} ax \\ ay \\ az \\ aw \end{bmatrix}$$

$$\begin{bmatrix} 1 \\ 0 \\ 0 \\ 0 \end{bmatrix} \cdot \begin{bmatrix} 0 \\ 20 \\ 0 \\ 0 \end{bmatrix}$$

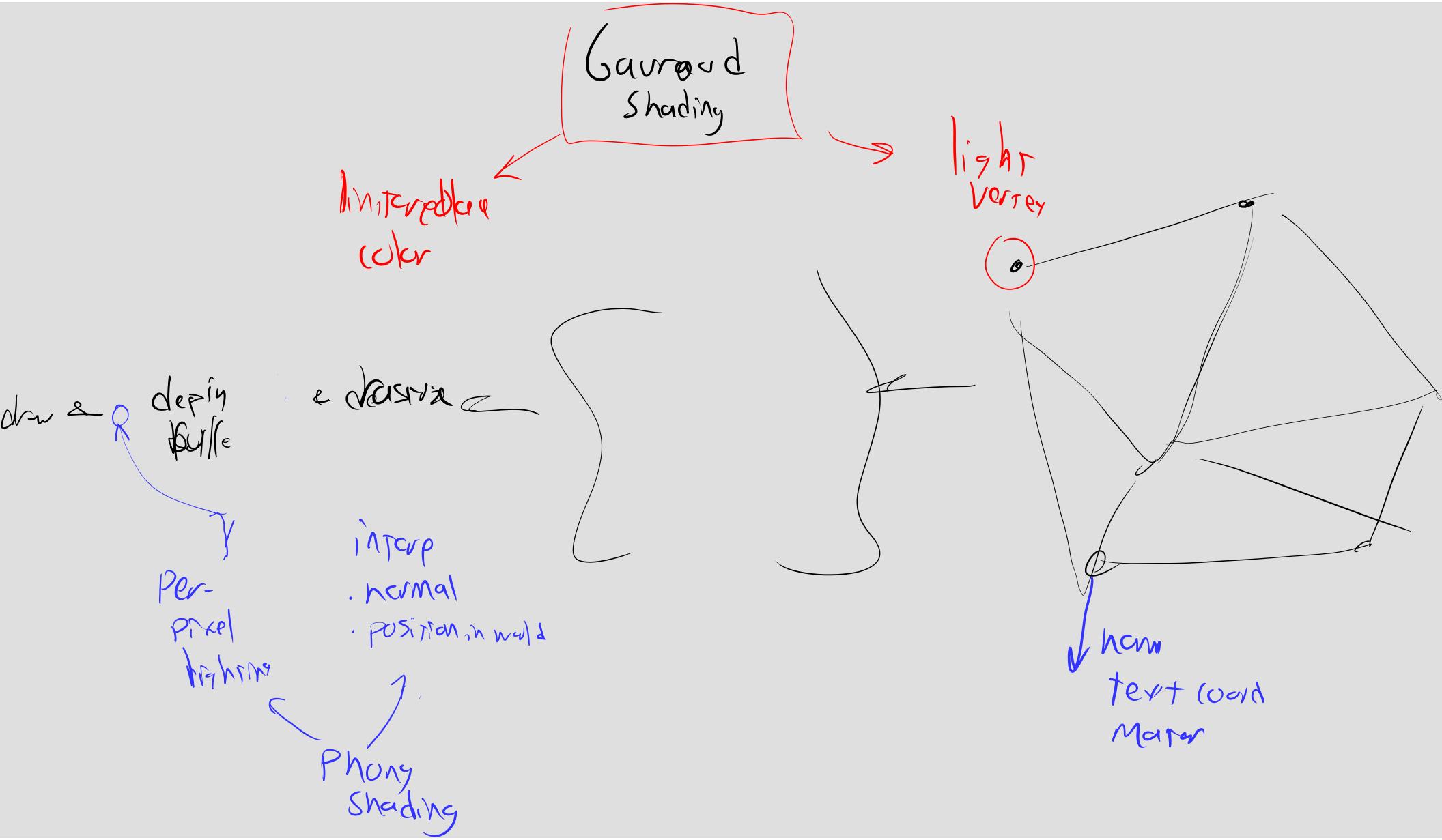
$\forall a \neq 0$

Points: $w = 1$ — enable affine

{offsets: point − point $\rightarrow w = 0$ — Maynul Scale}

direcion: $\|\vec{d}\|_2 = 1$ $(w = 0)$

$\rightarrow \begin{bmatrix} 1 \\ 20 \\ 0 \\ 0 \end{bmatrix}$


Gauraud
Shading
light
Vertex
color
depth
Per-
pixel
lighting
interp
. normal
. position in world
Phong
Shading
normal
texture coord
Material

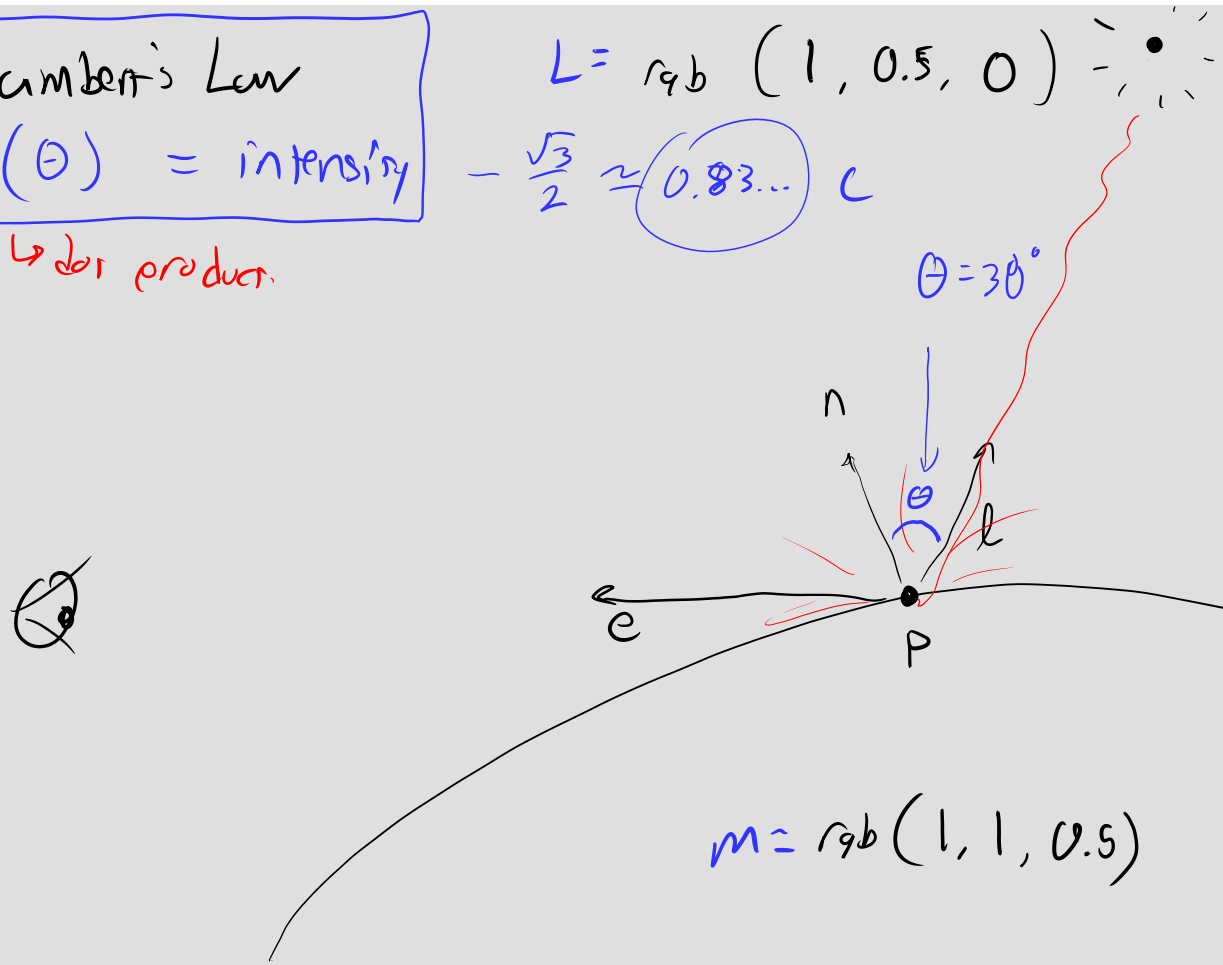
Lambert's Law

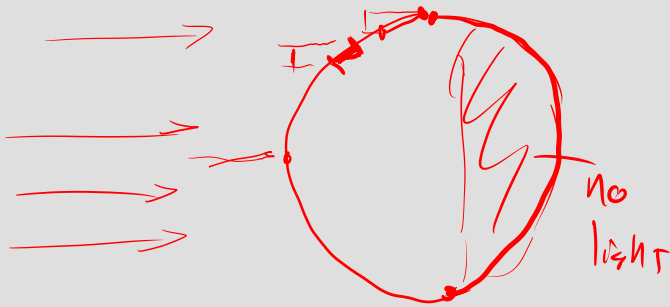
$\cos(\theta)$ = intensity

↳ dot product

$L = rgb(1, 0.5, 0)$

$\frac{\sqrt{3}}{2} \approx 0.83...$





$m = rgb(1, 1, 0.5)$

$\cos(\theta)(M \otimes L)$

$r = 1 \cdot 1 \cdot 0.83 \rightarrow 0.83$

$g = 1 \cdot 0.5 \cdot 0.83 \rightarrow 0.415$

$b = 0.5 \cdot 0 \cdot 0.83 \rightarrow 0$

Shine = fuzzy reflection of light

Specular

r = ref l across n

$(\cos(\phi))^{\alpha}$ = amount of shine

big = smaller, shines brighter