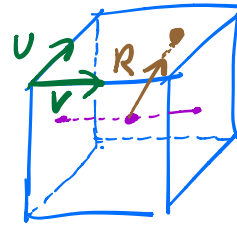
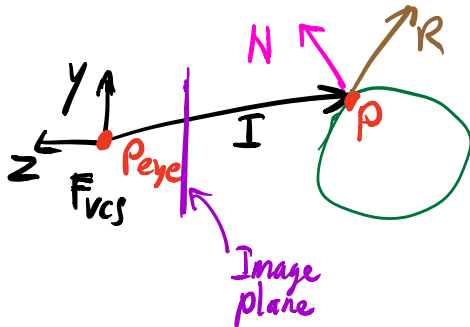


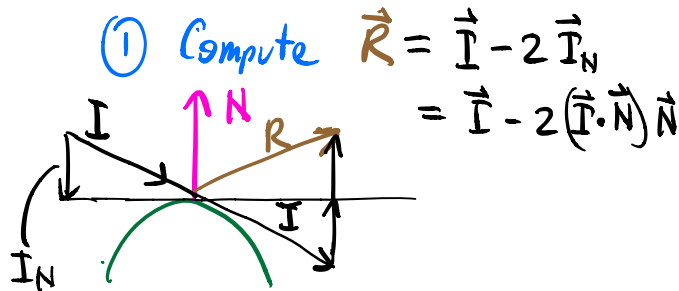
Environment Mapping

- models reflective surfaces



Cube map:
set of
6 texture
maps

- lookup what is seen
in direction R using
a cube-map



① Compute $\vec{R} = \vec{I} - 2\vec{I}_N$
 $= \vec{I} - 2(\vec{I} \cdot \vec{N})\vec{N}$

GLSL: $\vec{R} = \text{reflect}(\vec{I}, \vec{N})$

② Compute exiting face and (U,V) coords

\vec{R} exits top face if R_y is the largest component:

if $R.y \geq \text{abs}(R.x) \text{ \&\& } R.y \geq \text{abs}(R.z)$

Intersection point $P(x,y,z)$

Similar
triangles

$\frac{R_z}{R_y} = \frac{z}{y} \Rightarrow z = \frac{R_z}{R_y} y$

Lastly, we require

$\frac{z}{-1} \leq \frac{R_z}{R_y} \leq \frac{z}{1}$
 $\Leftrightarrow V=1$
 $\Leftrightarrow V=0$

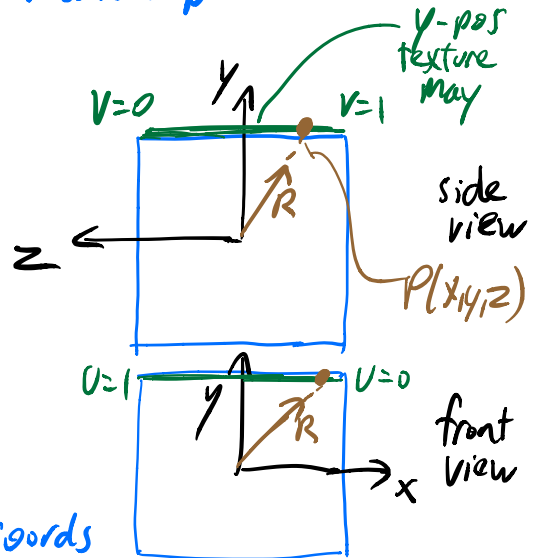
$\Rightarrow V = (-z + 1)/2$

Similarly for U:

$U = (-\frac{R_x}{R_y} + 1)/2$

$V = (-\frac{R_z}{R_y} + 1)/2$

③ $\text{gl_FragColor} = I_{\text{top}}[u,v];$ // do texture map lookup



Cube map alignments for A5:

