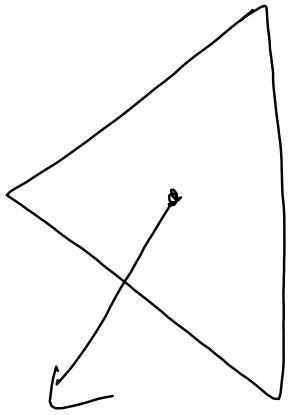
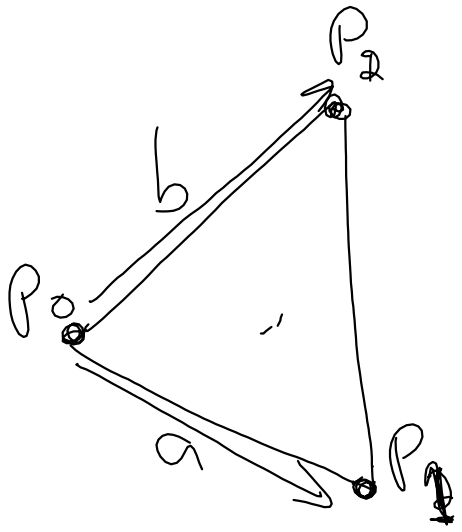
Tuesday, October 04, 2016
2:35 PM

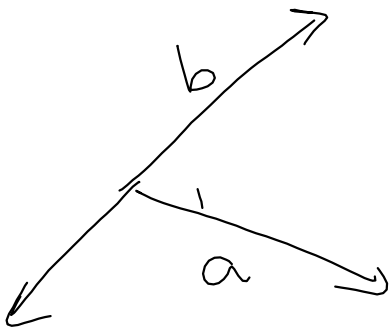
Normal Vectors

direction a surface faces

length = 1







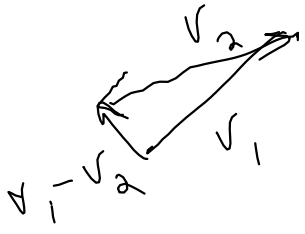
$a \times b$

$$\vec{a} = P_1 - P_0$$
$$\vec{b} = P_2 - P_0$$

$$a \times b = \begin{bmatrix} a_y \cdot b_z - a_z \cdot b_y \\ a_z \cdot b_x - a_x \cdot b_z \\ a_x \cdot b_y - a_y \cdot b_x \end{bmatrix}$$

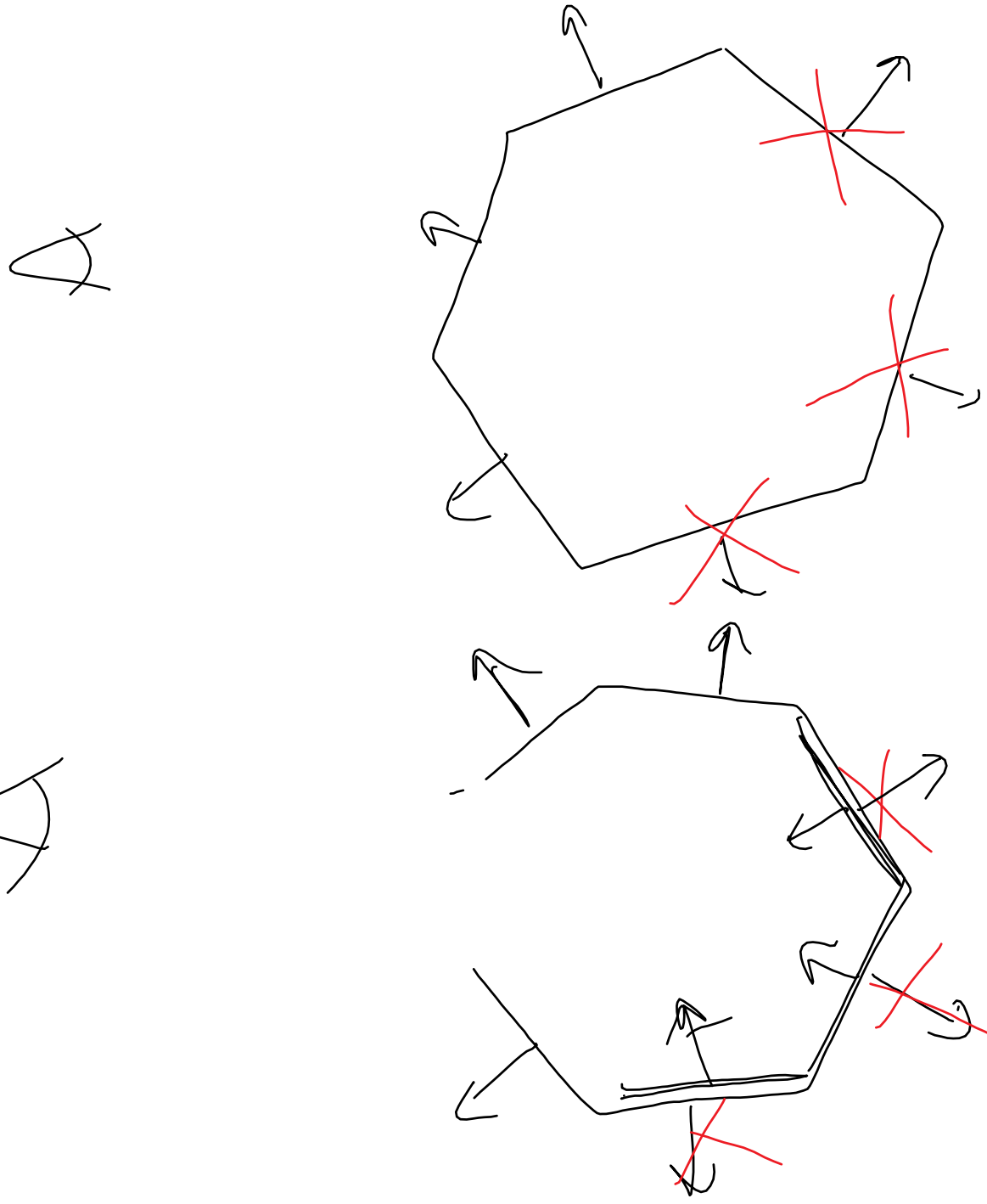
$\vec{v}_1 + \vec{v}_2$

$\vec{v}_1 - \vec{v}_2$



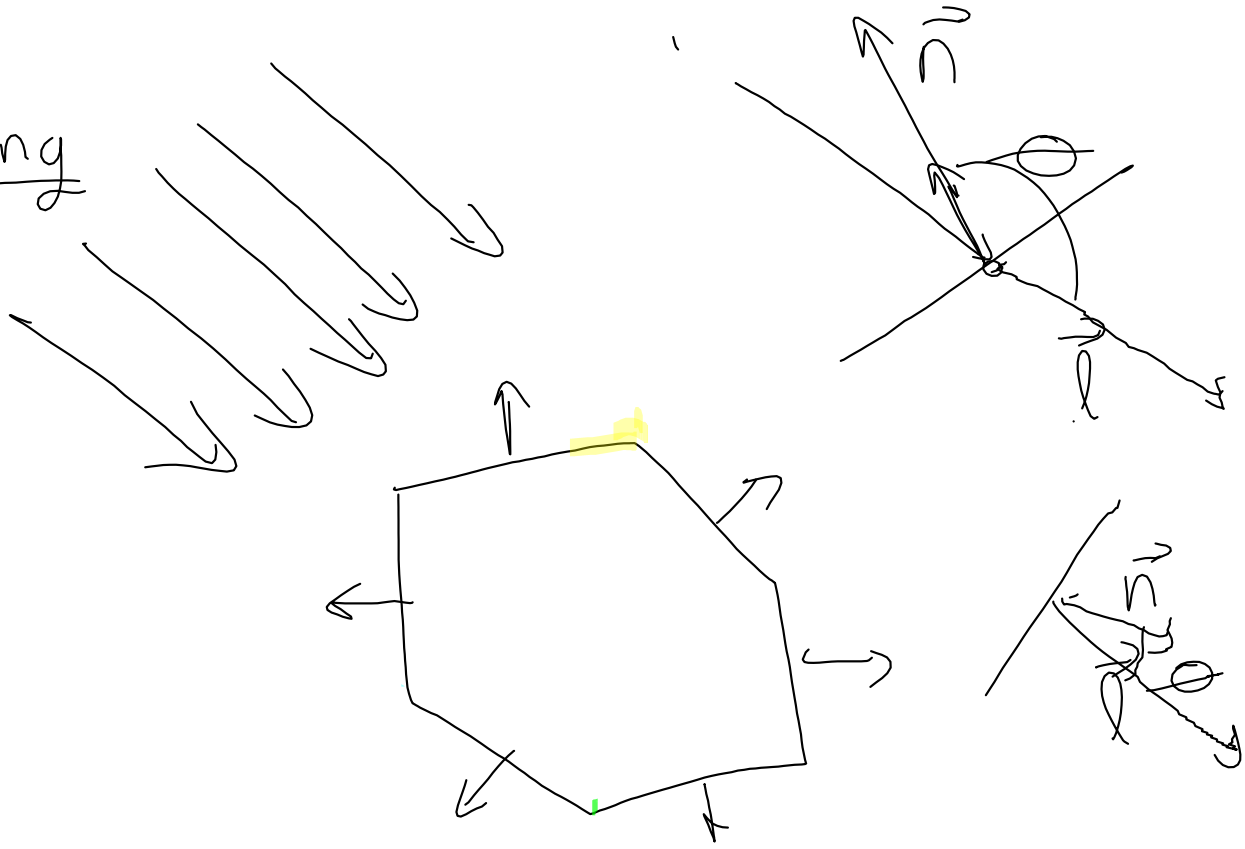
$$\vec{n} = \frac{a \times b}{\| a \times b \|} \qquad \| \vec{n} \| = 1$$

Tuesday, October 04, 2016
2:56 PM



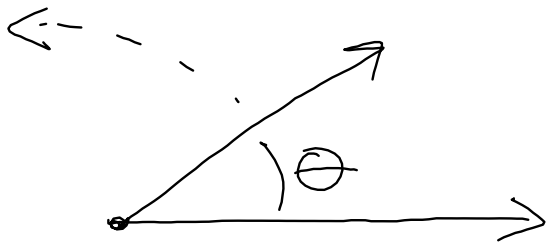
Tuesday, October 04, 2016
3:05 PM

Lighting



$$n \cdot l = n_x l_x + n_y l_y + n_z l_z =$$

$$\underbrace{\|\vec{n}\|}_{1} \cdot \|\vec{l}\| \cdot \cos\theta$$



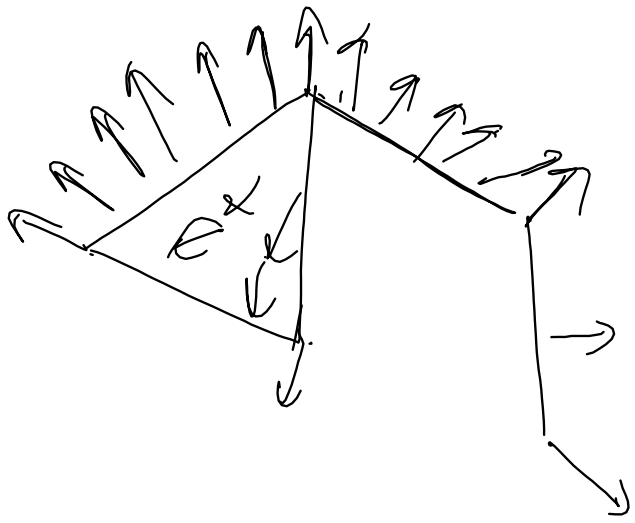
pix

0 $\theta = 0$ $\cos\theta = 1$

255 $\theta = \pi$ $\cos\pi = -1$

Flat shading

Tuesday, October 04, 2016
3:16 PM



phong
Shading

Tuesday, October 04, 2016
3:24 PM

WebGL

- HTML
- JavaScript
- shaders
  - GLSL - in the web page
    - vertex shader
    - fragment shader