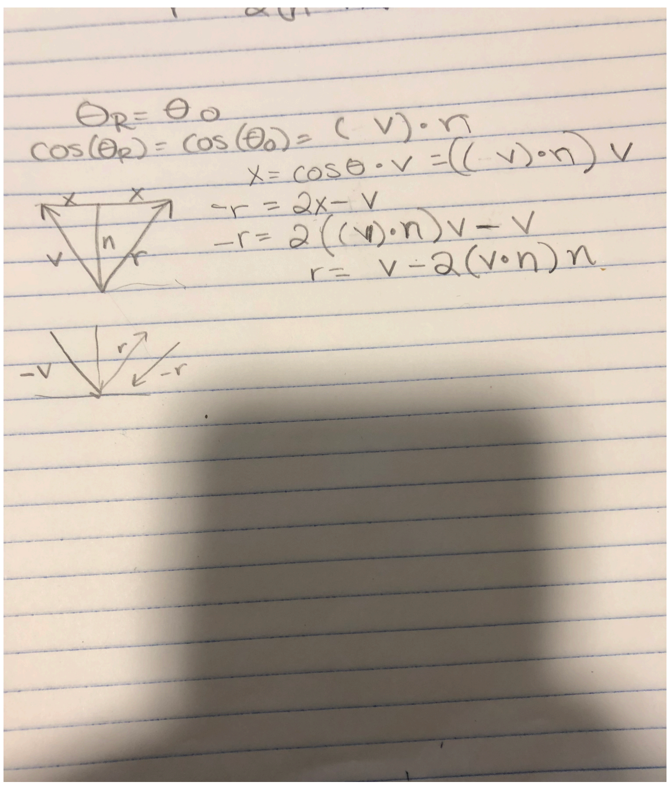
1.1 We need to include the specular term. The full Phong model combines ambient, Lambertian and specular terms. In Intersect we also did not account for attenuation, and the ambient color was calculated in a way different to the method in the Phong model.

1.2 We'll need to make it recursive, with the following high level lighting equation: Phong lighting + specular reflection + transmission. This equation includes the reflected and transmitted values that are a function of recursive rays.

2. See picture please! To compute the color from this secondary ray, we recursively create a new light that starts at this point, and see where it intersects in the same way we did when shooting a ray through each pixel. The intensity from the recursive rays is calculated with the same lighting equation as before.



3. Attenuation determines how much light will be shown by a pixel. It is the rate in which the light shown by a pixel diminishes; it represents the fact that light decreases with increasing distance. So a greater attenuation will mean less light shown by a pixel.

4. If something is obscuring an object, it will be unaffected. If the face of an object is facing away from the light and there are no other reflectant surfaces to bounce the light back, this face will be unaffected. If the object is pure black, it will be

unaffected. Also, if the light is so far away that the attenuation causes its intensity to be 0 or some epsilon threshold near 0, it also will not have an effect.

5. The range of the texture image, given the repetition and width/height, is (w * j) by (h * k). We multiply these by the values normalized to a unit square, u and v, because the mapping is proportional: (u * w * j), (v * h* k). Finally, we use the modulus operation to find the (s,t) these points correspond to:

s= (u* w*j) % w
t = (v * h * k) % h

6. ambient + specular + ((blend * textureColor) + (1-blend)*diffuse)

7. The specular exponent controls the shininess of an object. The higher the exponent, the smaller the highlight on that object.

8. Path tracing involves tracing several rays from the eye to each pixel, then bouncing the ray around randomly after it intersects with an object. The outgoing rays are weighted by the probability of going in that direction. It is statistically unbiased, can produce more photoreal images, and can better model indirect lighting. However, it can be quite slow. There can also be a lot of noise.
Ray tracing involves tracing a ray from the eye to each pixel, then bouncing the ray after intersection in the direction of reflectance/refractance. This second ray is calculated in terms of the ray from the intersection point to light sources in the scene. It is not as photoreal, but it can be computed a little more quickly.
Other versions of global illumination are radiosity, photon mapping, spherical harmonics, and metropolis light transport.