

リスト 2.7	attenuation.frag
---------	------------------

```
varying vec3 P;  
varying vec3 N;  
  
void main(void)  
{  
    vec3 L = gl_LightSource[0].position.xyz - P;  
    float d = length(L); //光源までの距離  
    //減衰計数  
    float attenuation = 1.0 / (gl_LightSource[0].constantAttenuation  
        + gl_LightSource[0].linearAttenuation * d  
        + gl_LightSource[0].quadraticAttenuation * d * d );  
    L = normalize(L);  
    N = normalize(N);  
  
    vec4 ambient = gl_FrontLightProduct[0].ambient;  
    float dotNL = dot(N, L);  
    vec4 diffuse = gl_FrontLightProduct[0].diffuse * max(0.0, dotNL);  
    vec3 V = normalize(-P);  
    vec3 H = normalize(L + V);  
    float powNH = pow(max(dot(N, H), 0.0), gl_FrontMaterial.shininess);  
    if(dotNL <= 0.0) powNH = 0.0;  
    vec4 specular = gl_FrontLightProduct[0].specular * powNH;  
    //統合  
    gl_FragColor = ambient + diffuse + specular;  
    //減衰率を乗じる  
    gl_FragColor *= attenuation;  
}
```