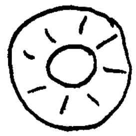
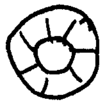
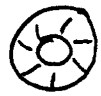
Supplement to Class Notes

Show X  $r_1 = 1$, $r_2 = 2$ is homotopy equivalent to  Y, $r = 1$

Let f:  $\longrightarrow$  be the map that sends points radially in.

g:  $\longrightarrow$  be the inclusion.

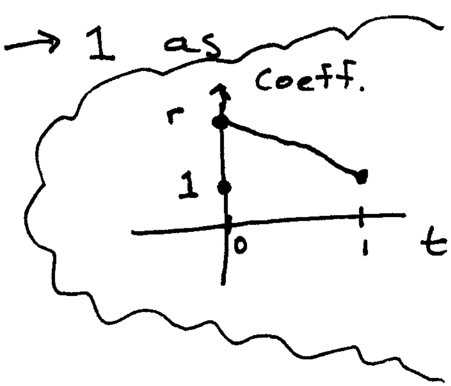
Then $f \circ g = id_Y$, but $g \circ f \neq id_X$. <u>Show $g \circ f \simeq id_X$</u>

Need continuous $H(x,t)$ s.t. $H(x,0) = x$ and $H(x,1) = g \circ f(x)$

<u>Q:</u> Where do we want to send a pt. on the annulus at time t?

Want $H(re^{i\theta}, t) = re^{i\theta}$ at $t = 0$
$H(re^{i\theta}, t) = e^{i\theta}$ at $t = 1$.

Want coefficient of $e^{i\theta}$ to go $r \rightarrow 1$ as t ranges $0 \rightarrow 1$.



$\therefore$ Slope is $1 - r$

Slope-intercept form:

$$\text{coeff} = (1-r)t + r = t - tr + r$$

So $\boxed{H(re^{i\theta}, t) = (t - tr + r)e^{i\theta}}$ is a homotopy from id_X to $g \circ f$, and X is homotopy equivalent to Y.