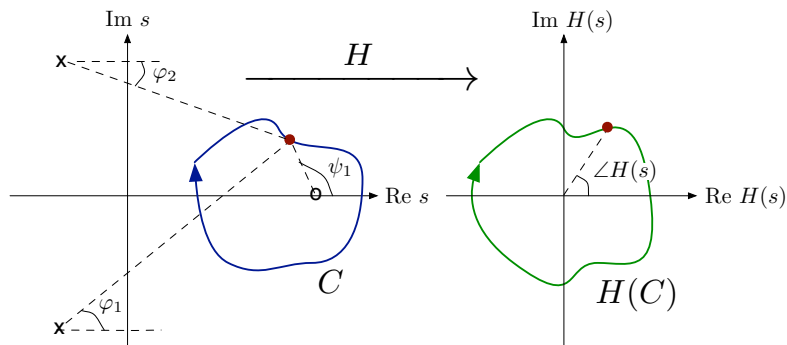


## Case 1: Contour Encircles a Zero



How does  $\angle H(s)$  change as we go around  $C$ ?

Let's see what happens to angles from  $s$  to poles/zeros of  $H$ :

- ▶  $\varphi_1$  and  $\varphi_2$  return to their original values
- ▶  $\psi_1$  picks up a net change of  $-360^\circ$
- ▶ therefore,  $\angle H(s)$  picks up a net change of  $-360^\circ$ , so  $H(C)$  encircles the origin once, clockwise ( $\odot$ )