1) An idealization of a plumber's pipe wrench is like this:

Assuming the pipe doesn't move and that the wrench doesn't slip, what are the forces on the pipe from the wrench at C and D.

2) A bicycle is balanced in 8 out of the page (2 direction) by forces you should ignore. At the moment of interest the right crank (attaching the crank axle to the pedal) is straight down. What force $F$ is needed to keep the bike from moving if:

a) A person sitting on the bicycle pushes the right pedal backwards with a 10 lb. For a real bike is $F>0$ or $F<0$?

b) A person standing next to the bicycle pushes back on the right pedal with a force of 10 lb. For a real bike is $F>0$ or $F<0$?

Answer in terms of:

- $r_w =$ wheel radius
- $r_p =$ crank radius to pedal
- $r_c =$ chain wheel radius

$F = ?$