Stokes flow in a channel-polygonal geometry ELENA LUCA, STEFAN LLEWELLYN SMITH, Department of Mechanical and Aerospace Engineering, UCSD — Motivated by modelling challenges arising in microfluidics, we consider low-Reynolds-number flow in a two-dimensional channel with different widths in the upstream and downstream directions. The channel geometry is approximated by a polygonal domain with angled edges at ‘transition’ points. We consider a pressure-driven flow with different inlet and outlet velocities related via the flux balance condition and obtain semi-analytical solutions using new transform methods. Our aim is to examine how different parameter choices affect the resulting flow as well as compute the pressure field everywhere in the flow domain.