

Problem 7-1

A four-stroke single-cylinder engine (bore = 8 cm, stroke = 8 cm) is operating at 3000 rpm. At this condition the combustion products ($k=1.25$) are at 500 kPa and 800 C just before the exhaust valve opens. The exhaust valve (a poppet valve) has a head diameter of 2.5 cm. Assume the exhaust valve fully opens instantaneously.

- A. Write a computer program (C++, Matlab, MatCad, Excel) that predicts the pressure, temperature, and mass remaining in the cylinder as a function of crankangle (time). Plot these results against crankangle (abscissa) for this geometry.
- B. Change the valve diameter to 4 cm and compare the results.