# FLUENT - Compressible Flow in a Nozzle- Problem 1

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## Problem 1

Consider the nozzle flow problem solved using FLUENT in the tutorial. Recall that the nozzle has a circular cross-sectional area, $A$, that varies with axial distance from the throat, $x$, according to the formula:

$A = 0.1 + x^2$

where $A$ is in square meters and $x$ is in meters. The stagnation pressure $p_o$ and stagnation temperature $T_o$ at the inlet are 101,325 Pa and 300 K, respectively.

Using the quasi-1D flow assumption, determine the static pressure at the nozzle inlet and outlet for the following conditions:

(a) Sonic flow at the throat, and supersonic, isentropic flow in the diverging section.
(b) Sonic flow at the throat, and subsonic, isentropic flow in the diverging section.
(c) Sonic flow at the throat and normal shock at the exit.

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