PROBLEM 1.8

TWO WATER PIPES OF EQUAL CROSS-SECTION, $A = 20\,cm^2$, JOIN TO FORM A SINGLE PIPE OF CROSS-SECTION, $A_3 = 40\,cm^2$. THE TWO INCOMING PIPES CARRY WATER OF DIFFERENT TEMPERATURE, $T_1 = 10°C$ AND $T_2 = 20°C$, RESPECTIVELY. IF THE VELOCITY IN THE TWO UPSTREAM PIPES IS THE SAME, WHAT IS THE TEMPERATURE IN THE PIPE DOWNSTREAM OF THE JUNCTURE? ASSUME THAT ALL PIPES ARE PERFECTLY INSULATED.