SECTION B

Answer ALL questions in the spaces provided.

11 A student learns that the energy required to heat water for a bath can be 10 times the energy required to heat water for a shower.

The student uses a shower for 9 minutes. The water comes out of the shower at 38 °C at a flow rate of $1.8 \times 10^{-5}\,m^3\,s^{-1}$.

The student usually fills the bath with 160 kg of water at 32 °C.

Deduce whether the bath uses 10 times more energy than using the shower.

initial temperature of water = 15 °C
density of water = $1.00 \times 10^3\,kg\,m^{-3}$
specific heat capacity of water = $4.18 \times 10^3\,J\,kg^{-1}\,K^{-1}$

(Total for Question 11 = 5 marks)