

Question 1

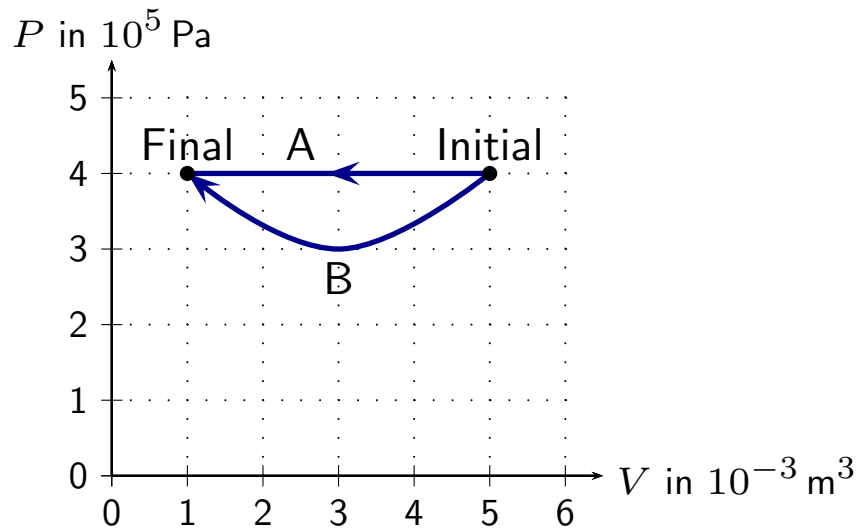
An ideal gas undergoes an adiabatic compression.

Which of the following is true?

1. The gas temperature increases.
2. The gas temperature decreases.
3. The gas temperature stays constant.

Question 2

Two identical samples of an ideal gas each undergo one of the two processes as illustrated.

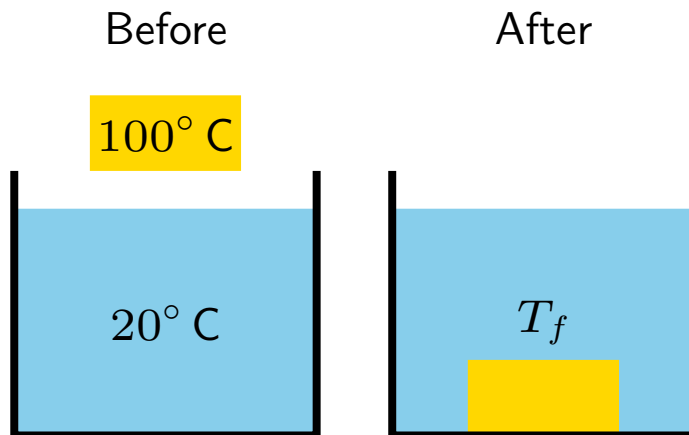


Which of the following is true?

1. $Q_A = Q_B = 0$
2. $Q_A = Q_B \neq 0$ and positive.
3. $|Q_A| > |Q_B|$ and both positive.
4. $|Q_A| < |Q_B|$ and both negative.
5. $|Q_A| > |Q_B|$ and both negative.

Question 3

A 10 kg block of gold, initially at 100°C is immersed into 1 kg of water initially at 20°C . The specific heat of water is 4190 J/kgK and gold 129 J/kgK .



Which of the following is true regarding the final temperature of the mixture?

1. $T_f \geq 60^\circ\text{C}$
2. $T_f = 60^\circ\text{C}$
3. $T_f \leq 60^\circ\text{C}$