Since \( C_p - C_v = \frac{V T \alpha^2}{K} \)

since \( T \alpha^2 \) approaches zero very rapidly as \( T \to 0 \), the difference \( C_p - C_v \) becomes increasingly negligible compared to \( C_v \).

So as \( T \to 0 \), \( \frac{C_p - C_v}{C_v} \to 0 \).

We had derived previously that \( C_p - C_v \) is a constant for an ideal gas. However, as \( T \to 0 \), quantum mechanical effects become important and the classical equation of state \( PV = n RT \) is no longer valid. Even if the interactions between the particles in a gas are so small that the gas cannot be treated as ideal, so this does not contradict the statement that \( C_p - C_v \) is a constant for an ideal gas, since that statement is not valid at such low temperatures.