Checking Two Removals in a Gas Model

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A classroom model puts two gases, R and S, into a sealed display chamber. At a fixed volume and temperature, the partial pressures of the gases add. The model can remove either gas completely without changing the amount of the other. Each test starts with a fresh copy of the same mixture.

Condition	**Chamber pressure (kPa)**
Both gases present	90
All R removed	30
All S removed	60

1 What is the partial pressure of R in the original mixture?

(1) 30 kPa

(2) 60 kPa

(3) 90 kPa

(4) 120 kPa

2 Explain how the two removal measurements can be used together to check the original pressure reading. [1]

Answer and work

The display tries a device that is intended to remove only R. From a fresh copy of the mixture, it lowers the pressure to 45 kPa at the same volume and temperature. A separate measurement confirms that the amount of S stayed the same.

3 Calculate the partial pressure of R still present. Show how the independent check about S enters the calculation. [1]

Answer and work

4 A student claims the device removed half the original R because it cut the total pressure in half. Evaluate the claim using the original and final R pressures. [1]

Answer and work