Comparing Two Wall-Impact Records

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

A classroom gas model records particles hitting a wall panel. Each hit transfers momentum to the panel. The model compares equal panel areas over one second. It multiplies the collision count by the average momentum transferred per collision. Pressure is proportional to that result divided by area for the same interval.

Sample	Collisions in one second	Average momentum transferred per hit (model units)
P	30	2
Q	20	3

1 Which statement follows from the readings at equal area?

(1) P gives a greater pressure because more particles hit.

(2) Q gives a greater pressure because each hit pushes more.

(3) The pressures are equal because the total transfers match.

(4) No pressure is exerted by Q.

2 Explain why knowing only how often particles hit the wall cannot determine which sample has higher pressure. [1]

Answer and work

The class doubles the monitored panel area in Q without changing the gas state. Collisions are uniform across the wall, so the number of hits in one second doubles and the average momentum transferred per hit stays the same.

3 Predict how the total momentum transferred per second and the pressure compare with their original values for Q. [1]

Answer and work

4 Evaluate the claim that using the larger panel makes the gas press more strongly on each square centimeter of wall. [1]

Answer and work