

Question 20 (3 marks)

Marks

A student is investigating inertial and non-inertial frames of reference. The student carries out a series of activities on a boat floating on a large, calm lake. The boat remained level during these activities.

3

Each activity and the student's observed results are recorded in the table.

Activity	Observation
Dropped a ball from a set height	Ball fell vertically with increasing velocity
Rolled a ball from one side of the boat to the other	Ball rolled across the floor with a constant velocity
Rolled a ball from the back of the boat towards the front of the boat	Ball rolled across the floor with a constant velocity

Justify the student's conclusion that: 'The boat can be regarded as an inertial frame of reference'.

The boat can be assumed as an inertial frame of reference because it remains at a constant velocity. As the ball was rolled in both directions across the floor it remained at a constant velocity in regards to the boat. The three above experiments support that the boat is inertial meaning at rest or experiencing a constant velocity.