Marks

Question 20 (3 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 consider an inertial frame of reference, because none of the activities could show it was an inertial frame of reference. The boat was not accelerating so the ball ~~fell~~ fell ~~~~ vertically, ~~with~~ following a path of a straight line. When ball was rolled across the floor from back to front and front to back, a constant velocity was observed as there was no acceleration which caused the ball to move faster or slower. Because no test could be done fully inside the frame of reference whether it was moving with constant velocity or resting and there was no acceleration the boat could be regarded as an inertial frame of reference.