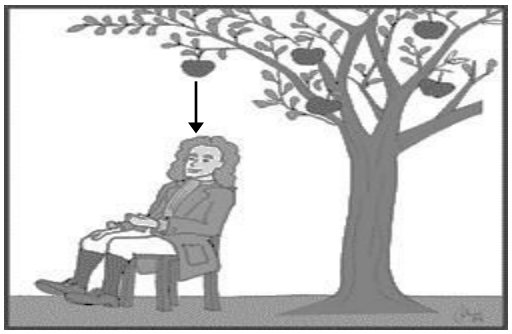
PENANG SANGAM HIGH SCHOOL
YEAR 11 PHYSICS
WEEK 5

1. The diagram given below represents a schematic diagram of Newton's experience with an apple.

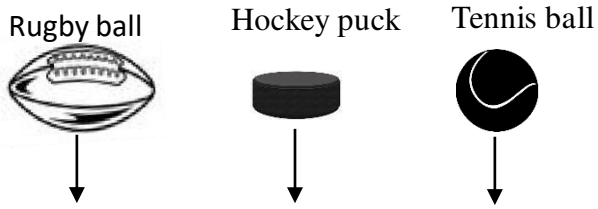


Source: https://www.aps.org

Which of the following fundamental forces was discovered by Newton after the apple fell on his head?

A. Nuclear force
B. Gravitational force
C. Magnetic force
D. Frictional force

2. A rugby ball, a hockey puck and a tennis ball are released from the same height in the absence of air resistance. Which of the following is true about their acceleration?



A. They all fall with a constant acceleration.
B. Acceleration of the rugby ball is greater than the other two.
C. Acceleration of the tennis ball is greater than the other two.
D. Acceleration of the hockey puck is greater than the other two.

3. In a free fall the acceleration of an object

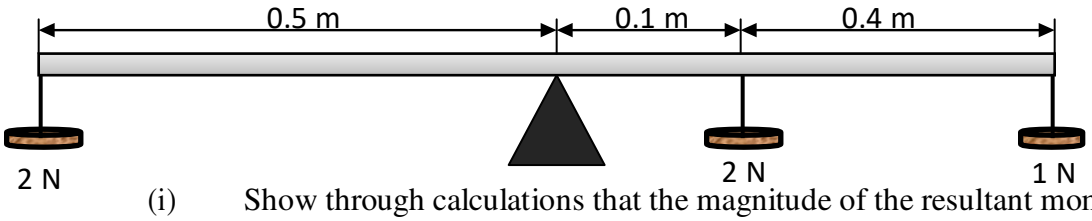
A. varies as it falls.
B. is vertically downwards.
C. is in an upward direction.
D. is perpendicular to the velocity.

4. In a car race, Anna switches her car of mass 500 kg to run on nitrous oxide fuel. The nitrous oxide allows her to develop 10000 N of force.

(i) State Newton's Second Law of motion.

(ii) Calculate the acceleration the race car attained when it was running on nitrous oxide fuel. **(use $F_N = m\ a$)**

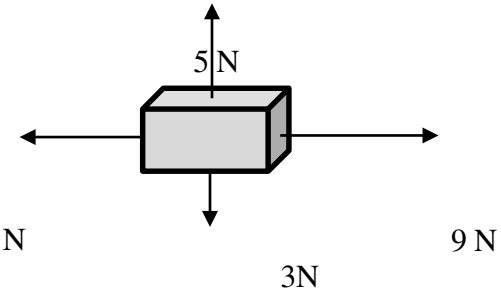
5. Tevita uses a metre ruler to set up an experiment on moments as shown in the diagram below. The pivot is at the centre but the ruler is not balanced.



(i) Show through calculations that the magnitude of the resultant moment is 0.3 Nm. **(find both the moments ie clockwise and anticlockwise separately, then subtract bigger minus smaller)**

(ii) State the direction in which the metre ruler turns. **(from the above working which moment is bigger)**

6. The vector diagram given below shows four forces acting on a wooden solid block.



Determine the magnitude of the resultant force acting on the block. (first work out the resultant from the opposite vectors, ie right and left, then up and down, then add this two using vector addition, join start to end, calculate the length of this line using Pythagoras theorem.