# Year 12 Physics 2021

Worksheet 1- Mechanics

1. A 1500 kg car is travelling on a road at 30 ms^{-1}. Suddenly brakes are applied for 1.5 seconds and the final speed reached is 10 ms^{-1}. Calculate the magnitude of the average force applied.

2. An 800 kg car is travelling at 10 ms^{-1}. A constant force of 1000 N acts on the car for 10 s. Calculate the final velocity of the car.

3. A shot-put ball of mass 6.5 kg travelling at 10 m s^{-1} rolls off a horizontal table 1.0 m high. The effects of air resistance may be ignored.

   a. Calculate the ball's horizontal velocity just as it strikes the floor.
   b. Determine the vertical velocity of the ball as it strikes the floor.
   c. Calculate the velocity of the ball as it reaches the floor.
   d. Find the time interval elapsed between the ball leaving the table and striking the floor.
   e. Calculate the horizontal distance travelled by the ball as it falls.

4. The diagram given below shows part of a micrometer screw gauge.
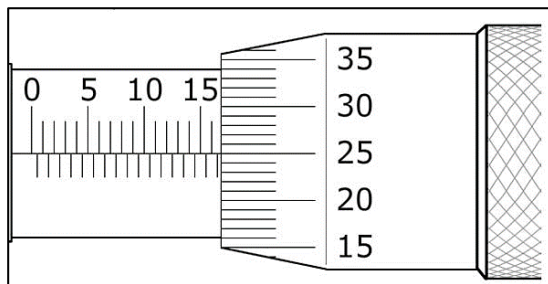
   Determine the reading shown on the micrometer screw gauge with its uncertainty.

5. Part of a vernier caliper is shown below.
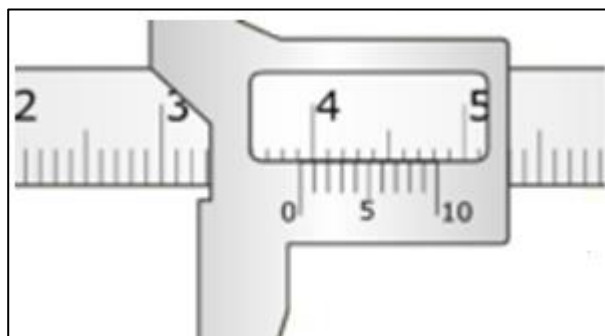
   Determine the reading shown on the vernier caliper with its uncertainty.