Cecil Andrews College.

Year 11 Physics Practical exam: Momentum Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mark: \_\_\_\_\_\_\_\_\_\_\_\_/15

Shape

Description automatically generated with medium confidence

In a physics experiment, Kevin squeezes a spring between two weighted cars, as shown in the diagram above. He releases the cars, which then travel in opposite directions to one another. Car 1 has a mass of 200g and car 2 has a mass of 300g. Using video analysis software, Kevin determined the position of each car at set time intervals.

Chart, scatter chart

Description automatically generated

1. a) What is the total momentum of the two-car system *before* Kevin releases them? (1 mark)

b) Using the graph, determine the *velocity* of car 1 and car 2 after they are released. (4 marks)

c) What is the total momentum of the two-car system after Kevin releases them? Comment on your results with respect to the law of conservation of momentum. (3 marks)

d) The cars have zero kinetic energy before they are released. Afterwards, they both have kinetic energy. Where did this energy come from? How could we increase the amount of energy given to the cars? (3 marks)

e) Kevin would like to determine the mass of an unlabeled disc in his collection. He adds it to the back of Car 1, increasing its mass. After releasing the spring, car 1 is found to have a velocity of ms-1 and car 2 is found to have a velocity of 0.12ms-1, what is the mass of the disc?

(4 marks)