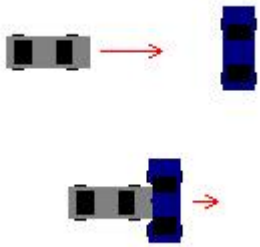


Name _____

Date _____



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Investigating an Accident Scene

You are an accident investigator for a local law enforcement agency. An accident has occurred in a zone where the speed limit is 30 mph. The driver of a 1200 kg car claims they were moving at a speed of 30 mph when they struck a 1400 kg car at rest. Before the accident, according to the driver, what was the speed of the car in m/s? (1609 m = 1 mile) Show your work.

According to the driver, what was the momentum of the 1200 kg car before the collision? Give an answer in kg m/s. Show your work.

After the collision, the two cars stuck together. According to the driver, what was the speed of the two cars after the collision? Show your work.

According to the driver, what was the speed of the two cars in mph?

What was the normal force acting on the two cars. Remember, normal force is equal to weight (mg). Show your work.

The coefficient of friction (μ) between the car tires and the road was 0.40. What is the force of friction acting on the two cars. (Friction = Normal force \times μ). Show your work.

It is the force of friction that causes the cars to ultimately come to a rest. According to the driver, what was the acceleration of the cars? ($f = ma$). Show your work.

If the driver was moving at the speed they claimed, how long would it have taken for the cars to come to a stop?

At the scene of the accident, you measure the skid marks of the two cars at 10 m. You conclude that this is the stopping distance of the two vehicles. You will be giving the driver a citation for causing an accident. Determine what the stopping distance would have been at the speed the driver claimed. Will you also be giving them a citation for speeding? Explain your answer.