**Physics of driving, turning, and drifting**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Before we start this demonstration, lets do a small little quiz on what you guys know. Do not worry too much if you cannot answer some of these questions, we will go over them!

Newton’s laws of motion:

First Law:

Every object will remain at \_\_\_\_\_\_\_\_\_ or in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ motion in a straight line unless compelled to change its state by the action of an external \_\_\_\_\_\_\_\_\_\_\_\_.

Second Law:

Force is equal to mass of the object times the change in \_\_\_\_\_\_\_\_\_\_\_ per change in \_\_\_\_\_\_\_\_\_.

Write down the equation!

Third Law:

For every action, there is an \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_ reaction.

Circular motion and centripetal force:

Write down the formula for centripetal force if you know it.

$$F\_{centripetal}=m $$

Prediction:

What do you think will happen if I try to turn the car around this track without drifting?

What should you do when you approach a turn?

Calculations:

If my car ways 1 lb and accelerates from 0 to 10 m/s in 10 seconds, find acceleration of the car and the force. Note that 1 kg = 2.2 lbs, find mass of the car up to 3 decimal points.

The car can reach up to 14 m/s, if the car continues to accelerate, it will understeer and crash at a turn. What does the driver need to do if we want to maintain a speed of 10 m/s?

The car enters a hairpin and makes a semi-circular turn. If the driver wants to be able to turn fast, he/she could change two properties. Write what you think is the two properties.

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