Pick ONE of the following scenarios below for Extra Credit: Assignment is to type a min 2 page double space essay on the following situation. Font is size 12 and regular set margins.

1. **Problem:**

The rising concern among athletic trainers and health advocates (and parents) regarding concussions and multiple concussions among high school football players has prompted numerous studies of the effectiveness of protective head gear and the forces and accelerations experienced by players. One study suggested that there is a 50% chance of concussions for impacts rated at 75 g's of acceleration (i.e., 75 multiplied by 9.8 m/s/s). (The average head impact results in 22 to 24 g's of acceleration.) If a player's head mass (with helmet) is 6.0 kg and considered to be a *free body*, then what net force would be required to produce an acceleration of 75 g's?

- Be sure to explain what the value of “g”.
- What would be the gravitational attraction between 2 heads of the same mass a distance of 1.5 m apart?
- Show and explain your work, as well as your reasoning, for how you are getting your answers.
- Be sure to consider the completeness of your response, supporting details, and accurate use of terms.

2. **Problem:**

Although many adolescents participate in recreational activities such as skateboarding or bike riding; many of them do not wear helmets. The law does not require children over the age of 12 to wear helmets or protective gear while riding a bike, however many children are injured because of accidents, falls, or juvenile behaviors while riding.

Understanding what you know about Newton's Laws of Motion, bodily injury, and benefits of wearing helmets and write an article about whether or not helmets should be required for adolescents during recreational activities.

- Should adolescents be required to wear helmets during recreational activities such as bike riding and skateboarding?
- Be sure to acknowledge competing views.
- Give examples from everyday life to illustrate and clarify your position.
- Justify your reasoning using Newton's Laws

3. Problem:

There is no specific time and place to pinpoint the origin of Tug of War. The contest of pulling a rope originates from ancient ceremonies and cults, which are found all over the world, such as in Egypt, Burma, India, Borneo, Japan, Korea, Hawaii and South America. The ancient Tug of War was performed in various styles. In Afghanistan, teams used a wooden stake instead of a rope to pull. In Korea, local villages used Tug of War to settle disputes for centuries. Tug of War was depicted on one of the 1988 Seoul Olympic commemorative 5000-won coin.

Later Tug of War became a pure contest of physical strength. In Greece, the cradle of the ancient Olympic Games, Tug of War sport around 500 BC was practiced by athletes either as a competitive sport or as an exercise in the physical training for other sports. In Western Europe evidence of Tug of War is found in the year 1000 AD, in the stories of the heroic champions of Scandinavia and Germany, who participated in the so called 'kräftige spieled' (power games). The Tug of War sport featured at the courts of the Chinese Emperors, as well as in Mongolia and Turkey. In the 15 Century, it was a popular contest in tournaments in the French Chateaux and in Competitions in the UK. Tug of War was not only a team sport. In several countries a man to man version of Tug of War existed. The Canadian Eskimos still have a Tug of War contest known as 'arsaaraq'.

Imagine you had a tug of war gam with your friends of silly thing that happened during the Winter Break. It was a Tug of War contest with the pullers sitting on the ground, using a short rope. The one who pulls his opponent over from his seated position is the winner. You were in a tug-of-war contest which your team won. Write an article that tells why your team won the contest.

- Describe a possible dispute that could happen between friends and how it came about.
- Describe what is happening according to Newton's Laws.
- Describe the forces acting on the teams and rope as part of the game.
- Include force diagram as you describe the forces