

HON 210 Homework #1

1. Find the escape velocity for Mars.
2. As you may know, GPS is a space-based radio-navigation system.
 - a. What are the origins of GPS?
 - b. What are the uses of GPS?
 - c. When was GPS first available for public use? Why not before that?
 - d. How many GPS satellites are there and how many are needed to find your position?
 - e. How does GPS know your location?
3. GPS satellite clocks are moving at 13,900 km/hr in orbits of radius 26,600 km. They circle the Earth twice per day.
 - a. According to special relativity, how much slower (in ns) are they after one day in orbit?
 - b. According to general relativity, how much faster (in ns) are they after one day?
4. Fermi questions deal with problems/questions where we don't have at enough data to calculate an exact result. So, we make an approximation based on general knowledge and common sense. So, here is a question: Are there more stars than grains of sand on Wrightsville Beach?