## Show all work.

1. Green light of wavelength exactly 5000A travels exactly 1 meter. What is the difference in phase from the beginning of the trip to the end?

2. What is the orbital period of the space shuttle 300 miles above surface Earth?

3. If the Earth were a black body (perfect absorber and perfect emitter of electromagnetic radiation) heated by the Sun and radiating energy into space to maintain thermal equilibrium, what would be its absolute temperature? Explain the steps in your solution clearly. What is this in degrees Fahrenheit? Given that Earth's average temperature is 59°F, what might explain the difference?