Early Universe: Inflation physics

Review questions

1. What is the horizon problem? Use the result that the angular separation corresponding to one horizon length at the photon decoupling time is about one degree (for a flat universe) to explain this problem.

2. 5. Use a potential energy function diagram to explain the idea of a phase transition in which the system is temporarily in a "false vacuum." How can such a mechanism be used to give rise to an effective cosmological constant?

3. How does the inflationary cosmology explain the origin of mass and energy in the universe as well as the origin of the cosmic structure we see today?