

Name: _____

CS422 Homework #1
Due in class on Monday, February 17th

1. Suppose a new wireless technology uses phase shift to encode data, there are 8 possible phase shifts available, and it takes the underlying hardware 10 nanoseconds to make a phase shift. How many bits per second can the technology transfer?

2. Signals propagate along an optical fiber at approximately $2/3$ of the speed of light. According to Google maps, the distance along highways from New York to LA is 2790 miles. If optical fiber is laid next to the highways on the Google route, what is the round-trip delay to propagate a signal from New York to LA and back?

3. Suppose a company that has offices in New York and LA must choose between an optical fiber connection (as in the previous question) and a Geosynchronous Earth Orbit satellite connection. How do the delays compare?

4. If radio waves could travel directly from New York to LA, the direct distance is 2462 miles, and radio waves could propagate at the speed of light, how much faster would a radio link be than an optical fiber running along a highway?