P4. A. The sum of 01011100 and 01100101 is 11000001. The 1s complement of that is 00111110.

B. The sum of 11011010 and 01100101 is 100111111. The 1s complement of that is 011000000.

C. Switching the bytes to 01010100 and 01101101 would still give the same sum and therefor the same 1s complement.

P7. The ACK packets essentially do the job that the sequence numbers would have done. The sender would have compared the sequence numbers to determine duplication. But instead, it will compare the ACK packets to determine duplication.

P15. RTT = 30 ms Packet size = 1,500 bytes R = 1 gbps

P26. A. 232 = 4,294,967,296 bytes = 4 GB

B. Total number of segments: . Since each segment number of bytes is 66 bytes, total number of bytes through the 155 mbps link is 8,012,999 x 66 = 528,857,934 bytes. Then the total number of bytes transmitted is 232 + 528,857,934 = 4,823,825,230 bytes. So, the total time is

P27. A. The sequence number is 207, the source port number is 302 and the destination port number is 80.

B. Everything will stay the same.

C. If the second segment arrives first, it would take the 207 sequence number.