City University of Hong Kong
Department of Electronic Engineering

EE3009 Data Communications and Networking

solution to Tutorial 1

1.
   a. $d_{prop} = m/s$ seconds.
   b. $d_{trans} = L/R$ seconds.
   c. end-to-end delay $= (m/s + L/R)$ seconds.
   d. The last bit of the packet has just left Host A.
   e. The first bit of the packet is in the transmission link, but has not reached Host B.
   f. The first bit of the packet has reached Host B.
   g. $m/s = L/R$, thus

$$m = \frac{L}{R}s = \frac{120}{56 \times 10^3}\left(2.5 \times 10^8\right) = 536\,\text{km}.$$

2. Source port number 61 and destination port number 37.

3. IP telephony and IP video calls generate time-sensitive traffic, which cannot be delayed by congestion control mechanisms. Also, they can tolerate some packet loss. Thus, UDP is more suitable.

4. The TCP segment has 20 bytes of header overhead in every segment, whereas UDP has only 8 bytes of overhead.

5 Yes, both segments will be directed to the same socket. For each received segment, at the socket interface, the operating system will provide the process with the IP addresses to determine the origins of the individual segments.