Subnetting

1. Given a class A network address with of 10.0.0.0 /24 answer the following questions:

   How many bits were borrowed from the host portion of this address? ___16_____

   What is the subnet mask for this network? __255.255.255.0_____

   How many usable subnetworks are there? ___2^16 _____

   How many usable hosts are there per subnet? __254 (2^8 – 2)_____

   What is the host range for usable subnet sixteen? __10.0.16.1-10.0.16.254_____

   What is the network address for usable subnet sixteen? ___10.0.16.0_____

   What is the broadcast address for usable subnet sixteen? ___10.0.16.255_____

   What is the broadcast address for the last usable subnet? ___10.255.255.255_____

   What is the broadcast address for the major network? __10.255.255.255_____

2. Develop an IP addressing scheme for the 192.168.2.0 class C address. You must use the appropriate subnet mask to create at least ten subnets, with at least ten hosts on each subnet.

   Which subnet mask did you choose? ___255.255.255.240_____

   How many subnets will be created using this mask? ___16 (2^4)_____

   How many hosts can be addressed on each subnet? __14 (2^4 – 2)_____

   Since you know how many hosts (16) each subnet contains, it is easy to determine the subnet numbers for all of the subnets (start at 0 and add 16).

   Complete the table below:

Subnet number	Subnetwork address
0	192.168.2.0 /28
1	192.168.2.16 /28
2	192.168.2.32 /28
3	192.168.2.48 /28
4	192.168.2.64 /28
5	192.168.2.80 /28

6	192.168.2.96 /28
7	192.168.2.112 /28
8	192.168.2.128 /28
9	192.168.2.144 /28
10	192.168.2.160 /28
11	192.168.2.176 /28
12	192.168.2.192 /28
13	192.168.2.208 /28
14	192.168.2.224 /28
15	192.168.2.240 /28

What is the subnetwork number for the fourt subnet? __192.168.2.48_____

Remember the fourth subnet created here is labeled subnet 3.

3. A company has the class B address 172.16.0.0. The company needs to create a subnetting scheme to provide the following:

- 36 subnets with at least 100 hosts
- 24 subnets with at least 255 hosts
- 10 subnets with at least 50 hosts

It is not necessary to supply an address for the WAN connection, since it is supplied by the Internet service provider.

Answer the following questions:

How many subnets are needed for this network? __70_____

What is the minimum number of bits that can be borrowed? ___7_____

What is the subnet mask for this network? __255.255.254.0_____

How many usable subnetworks are there? ___128 (2^7)_____

How many usable hosts are there per subnet? __510 (2^9 – 2)_____

Complete the following chart listing the first three subnets and the last four subnets:

Subnetwork #	Subnetwork ID	Host Range	Broadcast ID
0	172.16.0.0	172.16.0.1 - 172.16.1.254	172.16.1.255
1	172.16.2.0	172.16.2.1 – 172.16.3.254	172.16.3.255
2	172.16.4.0	172.16.4.1 – 172.16.5.254	172.16.5.255

3	172.16.6.0	172.16.6.1 – 172.16.7.254	172.16.7.255
124	172.16.248.0	172.16.248.1 – 172.16.249.254	172.16.249.255
125	172.16.250.0	172.16.250.1 – 172.16.251.254	172.16.251.255
126	172.16.252.0	172.16.252.1 – 172.16.253.254	172.16.253.255
127	172.16.254.0	172.16.254.1 – 172.16.255.254	172.16.255.255

What is the host range for subnet two? ___172.16.2.1 – 172.16.3.254_____

What is the broadcast address for the 126th subnet? ____172.16.251.255_____

What is the broadcast address for the major network? __172.16.255.255_____