RouterTeacherMan's Subnetting Word Problems

1. How many usable subnets do you have when using a subnet mask of 255.255.255.240 on Network ID 201.114.168.0?

Answer:
- 16 useable subnets and 14 useable hosts.

Explanation:
- The available usable host address range is: 201.114.168.1 - 201.114.168.14.
- Look in the subnet mask column for the value 240 to find the subnet mask for 255.255.255.240.
- Check the chart for the prefix, which is a /28.
- Look in the 4th octet of the Subnets column to find the useable subnets.
- Look in the 4th octet of the Block Size column to find the block size. Subtract 2 to get the usable hosts.

2. You are given Network ID 222.72.157.0, with a subnet mask of 255.255.255.248 to setup. How many subnets and useable hosts will you have?

Answer:
- 32 useable subnets and 6 useable hosts.

Explanation:
- The available usable host address range is: 222.72.157.1 - 222.72.157.6.
- Look in the subnet mask column for the value 248 to find the prefix for 255.255.255.248.
- Check the chart for the prefix, which is a /29.
- Look in the 4th octet of the Subnets column to find the useable subnets, which is 32.
- Look in the 4th octet of the Block Size column to find the block size, which is 8. Subtract 2 to get the usable hosts.

3. You are assigned a Network ID of 198.162.10.0 and asked to configure the network to provide at least eight useable subnets with at least 25 useable hosts on each subnet. What is the <u>BEGINNING</u> useable host IP address, of the <u>LAST</u> useable subnet in the network?

Answer:
- 198.16.10.225 is the 1st, or beginning useable host.

Explanation:
- The first step is to identify the prefix. In this case it is a /27 because the 4th octet Block Size of 32 and the 4th octet Subnets of 8 meet this requirement.
- The key word in this problem is the word "LAST". The last usable subnet ends in 255. So, subtract 31 from 255 to get the network address of 224.
- The first useable host is .225.
- The available usable host address range is: 198.162.10.225 - 198.162.10.254
- CIDR Address Range: 198.162.10.224 - 198.162.10.255, is also the last useable subnet.

4. How many useable hosts are on each subnet when the Network ID is 199.215.210.0 and the subnet mask is 255.255.255.252?

Answer:
- 2 useable hosts.

Explanation:
- The first step is to identify in the subnet mask column the value for 252. This leads us to prefix /30.
- The block size for a /30 is 4. The answer is 2, because we subtract the network and broadcast for every subnet to obtain the useable hosts.
- The available usable host address range is: 199.215.210.1 - 199.215.210.2.

5. You are given the Network ID 190.90.0.0, with a subnet mask of 255.255.192.0 to setup. What are the High Order Bits (Leading Bit Values) for this network?

Answer:
- The High Order Bits (or the Leading Bit Values) for 190.9.0.0 are: **10**

Explanation:
- The High Order Bits, or the Leading Bit Values, are defined by the **first octet** of any ip address.

    0. **0** 0000000 to 127. **0** 1111111 (Class A)
    128. **10** 000000 to 191. **10** 111111 (Class B)
    192. **110** 00000 to 223. **110** 11111 (Class C)

- CIDR Address Range: 190.90.0.0 - 190.90.63.255
- **10** 111110.01011010.00000000.00000000 is the binary for 190.90.0.0.

6. You are assigned a Network ID of 162.160.0.0, and asked to configure the network to provide at least 1000 useable hosts? What would be the subnet mask for this network?

Answer:
- 255.255.252.0.

Explanation:
- The block size is 4.
- Go to the 3rd octet for this problem, and locate the 1K block size location. This indicates a prefix of /22.
- The available usable host address range is: 162.160.0.1 - 162.160.3.254 = 1,022 useable hosts.
- CIDR Address Range: 162.160.0.0 – 162.160.3.255.
- 162.160.0.0/22.

7. **How many useable hosts are on each subnet when the Network ID is 150.150.0.0 and the subnet mask is 255.255.192.0?**

   Answer:
   - 16,382

   Explanation:
   - Find the 192 under the subnet mask column and recognize that the prefix is /18 since we are in the 3rd octet.
   - Find the powers of 2 and recognize that 16,384 is the Block Size, and the useable hosts are 16,382.
   - CIDR Address Range: 150.150.0.0 - 150.150.63.255
   - 150.150.0.0/18.

8. **You are assigned a Network ID of 145.19.0.0, and asked to configure the network to provide at least 100 useable subnets, with at least 500 hosts on each subnet. What is the <u>ENDING</u> useable host IP address, of the <u>NINTH</u> useable subnet in the network?**

   Answer:
   - 145.19.17.254/23.

   Explanation:
   - Calculate the prefix, which is /23, and the block size which is 2.
   - Count the subnets in the 3rd octet up to the 9th subnet, which will give you the ending useable host ip.
   - The ninth usable subnet is: 145.19.16.0 - 145.19.17.255.
   - The ninth subnet, usable host address range is: 145.19.16.1 - 145.19.17.254.
   - The Subnet Mask is: 255.255.254.0.

9. **You are a private contractor hired by the large company to setup the network for their enterprise. The Network ID is 33.0.0.0 and you need at least 125 subnets in their large network with at least 125,000 hosts on each of the subnets. What would be the subnet mask for this network?**

   Answer:
   - 255.254.0.0.

   Explanation:
   - Find the prefix by finding the 2nd octet block size, 128K, which gives us a prefix of /15.
   - The bock size is 2.
   - The usable host address range is: 33.0.0.1 - 33.1.255.254.

10. **You are given Network ID 55.0.0.0, with a subnet mask of 255.240.0.0 to setup. How many subnets and useable hosts will you have?**

    Answer:
    - 16 useable subnets.
    - 1,048,574 useable hosts.

    Explanation:
    - The prefix is a /12 since the second octet value of 240 points us to this value.
    - CIDR Address Range: 55.0.0.0 - 55.15.255.255.