1. Create 500 subnets using 12.0.0.0, plot 0nly first 10 and last 5.

Class of IP: 12.0.0.0- Class A

                    12.1111111.10000000.00000000.

Requirement: 500 subnets

Borrowed bits: 9 bits

2^9 - 2 => 500= 512 subnets

512 - 2 = 510 True

New subnet mask: 255.255.128.0

                         11111111.1111111.10000000.00000000

                1bit = 128 -------there is only 1 bit borrowed from the third octet.

                12.255.128.0

From the third octet there are 7 remaining bits

Range between network: 2^7= 128

 256-Subnet Mask-------256-128= 128

         Range-----128

2. Subnet 190.11.0.0/20 creating 10 subnets.

Class of IP: 190.11.0.0/20- Class B

                    190.11.11110000.00000000

Requirement: 10 subnets

Borrowed bits: 4 bits

2^4 - 2 => 10

 16 - 2 = 14 True

New subnet mask: 255.255.240.0

                        11111111.1111111.11110000.00000000

4 bits= 128+64+32+16= 240------ There are 4 bits borrowed from the third octet.

From the third octet there are **4 remaining** bits.

Range between network: 2^4= 16

 256-Subnet Mask-------256-240= 16

     Range----- 16

3. **Using 19.15.128.0/22 create 15 subnets.**

   Class of IP: 19.15.128.0/22- Class A
   11111111.11111111.10000000.00000000
   Requirement: 15 subnets
   Borrowed bits: 5 bits
             $2^5 - 2 => 15 = 32$----subnets
             32 - 2 = 30 True- 30 usable
   New subnet mask: 255.255.252.0
          /22 ----------11111111.11111111.11111100.00000000
      19   15   252   0
      ^   ^   ^   ^
   00010011.00001111.11111100.0000000

   *From the third octet there are **2 remaining** bits.*
   Range between network: $2^2= 4$
   256-Subnet Mask-------256-252= 4
    Computed **Range----- 4**