

# Custom Subnet Masks

## Problem 1

Number of needed subnets **14**

Number of needed usable hosts **14**

Network Address **192.10.10.0**

Address class   C  

Default subnet mask   255 . 255 . 255 . 0  

Custom subnet mask   255 . 255 . 255 . 240  

Total number of subnets           16          

Total number of host addresses           16          

Number of usable addresses           14          

Number of bits borrowed           4          

**Show your work for Problem 1 in the space below.**

<i>Number of</i>	256	128	64	32	16	8	4	2	-	<i>Number of</i>
<i>Subnets</i>	-	2	4	8	32	64	128	256		<i>Hosts</i>
		128	64	32	8	4	2	1	-	<i>Binary values</i>
<b>192 . 10 . 10 . 0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

128  
 64  
 32  
 +16  
 -----  
 240

Add the binary value numbers to the left of the line to create the custom subnet mask.

16  
 -2  
 -----  
 14

Observe the total number of hosts.  
Subtract 2 for the number of usable hosts.

# Custom Subnet Masks

## Problem 2

Number of needed subnets **1000**  
 Number of needed usable hosts **60**  
 Network Address **165.100.0.0**

Address class B

Default subnet mask 255 . 255 . 0 . 0

Custom subnet mask 255 . 255 . 255 . 192

Total number of subnets 1,024

Total number of host addresses 64

Number of usable addresses 62

Number of bits borrowed 10

Show your work for Problem 2 in the space below.

Number of Hosts -	65,536	32,768	16,384	8,192	4,096	2,048	1,024	512	256	128	64	32	16	8	4	2
Number of Subnets -	2	4	8	16	32	64	128	256	512	1024	2048	4096	8192	16384	32768	65536
Binary values -	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1
	165	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0

  

	128	128
	64	+64
	32	192
	16	
	8	
	4	
	2	
	+1	
	<u>255</u>	

  

64	Observe the total number of hosts.
-2	
<u>62</u>	Subtract 2 for the number of usable hosts.

Add the binary value numbers to the left of the line to create the custom subnet mask.

# Custom Subnet Masks

## Problem 3

*/26* indicates the total number of bits used for the network and subnetwork portion of the address. All bits remaining belong to the host portion of the address.

Network Address **148.75.0.0 /26**

Address class B

Default subnet mask 255 . 255 . 0 . 0

Custom subnet mask 255 . 255 . 255 . 192

Total number of subnets 1,024

Total number of host addresses 64

Number of usable addresses 62

Number of bits borrowed 10

Show your work for Problem 3 in the space below.

Number of Hosts	1	2	4	8	16	32	64	128	256	512	1024	2048	4096	8192	16384	32768	65536
Number of Subnets	1	2	4	8	16	32	64	128	256	512	1024	2048	4096	8192	16384	32768	65536
Binary values	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1	
	148	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Add the binary value numbers to the left of the line to create the custom subnet mask.

$$\begin{array}{r}
 128 \\
 64 \\
 32 \\
 16 \\
 8 \\
 4 \\
 2 \\
 +1 \\
 \hline
 255
 \end{array}$$

$$\begin{array}{r}
 1024 \\
 -2 \\
 \hline
 1,022
 \end{array}$$

Subtract 2 for the total number of subnets to get the usable number of subnets.

64 Observe the total number of hosts.  
 $\frac{-2}{62}$  Subtract 2 for the number of usable hosts.