

IP Addressing and Subnetting Exercises

Answers

1. Fill in the table below:

Prefix	Decimal Mask	Total Addresses	Usable Addresses
/24	255.255.255.0	256	254
/30	255.255.255.252	4	2
/22	255.255.252.0	1,024	1,022
/26	255.255.255.192	64	62
/29	255.255.255.248	8	6
/16	255.255.0.0	65,536	65,534
/21	255.255.248.0	2,048	2,046
/27	255.255.255.224	32	30
/25	255.255.255.128	128	126
/19	255.255.224.0	8,192	8,190

2. Compare the two IP Addresses using the given mask. Are they in the same subnet?

First IP Address	Second IP Address	Mask	Same Subnet?
192.168.0.5	192.168.0.100	255.255.255.192	N
192.168.0.5	192.168.0.100	/25	Y
172.16.35.7	172.16.34.120	255.255.254.0	Y
10.5.20.217	10.6.20.200	255.255.224.0	N
192.168.0.255	192.168.1.0	/23	Y
175.25.197.13	175.25.190.49	255.255.224.0	N
175.25.197.13	175.25.190.49	/17	Y
115.11.58.13	115.11.58.11	255.255.255.252	N
137.85.67.111	137.85.76.94	/18	Y
206.195.18.35	206.195.18.22	/28	N

3. Determine the subnet and broadcast addresses of the subnet that contains the given IP address and mask.

IP Address	Mask	Subnet Address	Subnet Broadcast
192.168.1.45	255.255.255.0	192.168.1.0	192.168.1.255
192.168.1.45	255.255.0.0	192.168.0.0	192.168.255.255
192.168.1.45	/27	192.168.1.32	192.168.1.63
10.0.11.12	255.255.254.0	10.0.10.0	10.0.11.255
10.0.12.12	255.255.254.0	10.0.12.0	10.0.13.255
10.0.13.12	255.255.254.0	10.0.12.0	10.0.13.255
172.16.35.22	/30	172.16.35.20	172.16.35.23
222.11.33.115	255.255.255.128	222.11.33.0	222.11.33.127
126.84.76.211	<default mask>	126.0.0.0	126.255.255.255
126.84.76.211	0.0.0.0	0.0.0.0	255.255.255.255

4. You've been given a block of IP addresses as defined by the mask in the first column. You decide to subdivide that block into multiple smaller blocks as defined by the mask in the second column. Fill in the table with the missing information. You can use all subnets (subnet zero is not reserved.)

Mask Given	Mask Giving Out	# of Subnets	Usable Hosts Each
/24	/27	8	30
/24	255.255.255.252	64	2
/15	/25	1,024	126
255.255.240.0	255.255.255.192	64	62
255.255.252.0	255.255.255.128	8	126
255.0.0.0	255.255.0.0	256	65,534
/21	/27	64	30
255.255.254.0	255.255.255.224	16	30
/25	255.255.255.248	16	6
255.255.248.0	255.255.252.0	2	1,022