

## - Subnetting Exercises Answers -

**(Please note:** For all subnetting questions, assume the ‘all-zeroes’ and ‘all-ones’ subnets are usable. Or, in the Cisco vernacular, assume we have “ip subnet-zero” enabled.)

1. Convert the following decimal numbers to binary.

100: 01100100

254: 11111110

113: 01110001

66: 01000010

2. Convert the following binary numbers to decimal.

10101010: 170

00011100: 28

11101110: 238

01100111: 103

3. You have the following address: 192.16.5.133/29

How many **total** bits are being used to identify the network, and how many **total** bits identify the host?

*29 bits identify the network, 3 bits identify the host.*

4. What is the full subnet mask for address 172.16.5.10/28?

255.255.255.240

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5. You currently use the default mask for your IP network 192.168.1.0. You need to subnet your network so that you have 30 additional networks, and 4 hosts per network. Is this possible, and what subnet mask should you use?

*Yes it is possible, using subnet mask 255.255.255.248.*

6. You still are using the default mask for your IP network 192.168.1.0. You need to subnet your network so that you have 5 additional networks, and 60 hosts per network. Is this possible, and what subnet mask should you use?

*No, it is not possible.*

7. You have sub-netted your class C network 192.168.1.0 with a subnet mask of 255.255.255.240. Please list the following: number of networks, number of hosts per network, the full range of the first three networks, and the usable address range from those first three networks.

*Number of networks = 16*

*Number of hosts = 14*

*Full Range for first three networks:*

<i>192.168.1.0-15</i>
<i>192.168.1.16-31</i>
<i>192.168.1.32-47</i>

*Usable Range for first three networks:*

<i>192.168.1.1-14</i>
<i>192.168.1.17-30</i>
<i>192.168.1.33-46</i>

\* \* \*

8. You have sub-netted your class C network 200.138.1.0 with a subnet mask of 255.255.255.252. Please list the following: number of networks, number of hosts per network, the full range of the first three networks, and the usable address range from those first three networks. Additionally, identify the broadcast addresses for each network.

*Number of networks = 64*

*Number of hosts = 2*

<i>Full Range for first three networks:</i>	<i>200.138.1.0-3</i>
	<i>200.138.1.4-7</i>
	<i>200.138.1.8-11</i>

<i>Usable Range for first three networks:</i>	<i>200.138.1.1-2</i>
	<i>200.138.1.5-6</i>
	<i>200.138.1.9-10</i>

<i>Broadcast Addresses for first three networks:</i>	<i>200.138.1.3</i>
	<i>200.138.1.7</i>
	<i>200.138.1.11</i>

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