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# **Subnetting Tricks and Tips**

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## TCP/IP ADDRESSING AND SUBNETTING STUDY SHEET

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It seems that one of the things individuals new to networking struggle with is subnetting. While it may seem difficult at first don't give up. Once you master subnetting you will be ready to move onto other networking challenges! To help those of you who are attempting mastery of this subject we have developed the following practice questions.

1. IP Address = 128.12.34.71  
Subnet Mask = 255.255.255.0  
  
What is the subnet number?  
Host number?
2. IP Address = 192.55.12.120  
Subnet Mask = 255.255.255.240  
  
What is the subnet number?  
Host number?
3. What is the network address of a TCP/IP host that has an IP address of 203.23.32.34?
4. What is the node (or host) address of a TCP/IP host that has an IP address of 182.23.32.34?
5. What is the subnet mask for 184.231.138.239 if the first 10 bits of the node address is used for subnetting?
  - a. 255.255.192.0
  - b. 255.255.224.0
  - c. 255.255.255.224
  - d. 255.255.255.192
6. What are the two parts of an IP address?
  - a. network number and subnet number
  - b. network number and host number
  - c. subnet number and host number
  - d. network number and dotted decimal
7. Which bits are set for all class B network numbers?  
the first bit is "0"
  - a. the first two bits are "10"
  - b. the first three bits are "110"
  - c. the first four bits are "1110"
8. Which of the following class B network numbers is considered a private address?
  - a. 10.0.0.0
  - b. 192.168.1.0
  - c. 172.16.0.0
  - d. 172.32.0.0
9. When the host field is set to "0", what does the address refer to?

- a. the wire itself
  - b. the first host of a subnet
  - c. the broadcast address
  - d. "0" is not a legal octet value
10. How many hosts are possible with 8-bit host field?
- a. 253
  - b. 254
  - c. 255
  - d. 256
11. Using the first octet rule, what is the class of the IP address 172.16.4.2?
- a. A
  - b. B
  - c. C
  - d. D
12. Using the first octet rule, what is the class of the IP address 239.123.14.43?
- a. A
  - b. B
  - c. C
  - d. D
13. What is the dotted decimal subnet mask represented by a /16 binary bit count?
- a. 255.255.255.255
  - b. 255.255.255.0
  - c. 255.255.0.0
  - d. 255.0.0.0
14. What is the subnet portion of the IP address 172.16.4.164 with a subnet mask 255.255.255.0?
- a. 172.0.0.0
  - b. 172.16.0.0
  - c. 172.16.4.0
  - d. 172.16.4.160
15. What is the subnet portion of the IP address 172.16.4.164 with a subnet mask 255.255.255.192?
- a. 172.16.4.0
  - b. 172.16.4.128
  - c. 172.16.4.160
  - d. 172.16.4.164
16. What is the subnet portion of the IP address 172.16.4.164 with a subnet mask 255.255.255.224?
- a. 172.16.4.0
  - b. 172.16.4.128
  - c. 172.16.4.160
  - d. 172.16.4.164
17. What is the first possible IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.0 lives?
- a. 172.16.4.1
  - b. 172.16.4.33
  - c. 172.16.4.161
  - d. 172.16.4.163
18. What is the first possible IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.192 lives?

- a. 172.16.4.1
  - b. 172.16.4.129
  - c. 172.16.4.161
  - d. 172.16.4.163
20. What is the first possible IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.224 lives?
- a. 172.16.4.1
  - b. 172.16.4.129
  - c. 172.16.4.161
  - d. 172.16.4.163
21. What is the broadcast IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.0 lives?
- a. 172.16.4.1
  - b. 172.16.4.33
  - c. 172.16.4.161
  - d. 172.16.4.255
22. What is the broadcast IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.192 lives?
- a. 172.16.4.1
  - b. 172.16.4.33
  - c. 172.16.4.191
  - d. 172.16.4.255
23. What is the broadcast IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.224 lives?
- a. 172.16.4.1
  - b. 172.16.4.63
  - c. 172.16.4.191
  - d. 172.16.4.255
24. Which of the following must use a router to communicate with the host 129.23.144.10 if the subnet mask is 255.255.192.0?
- a. 129.23.191.21
  - b. 129.23.127.222
  - c. 129.23.130.33
  - d. 129.23.148.127
25. Which IP address is located on the same subnet as 130.12.127.231 if the subnet mask is 255.255.192.0?
- a. 130.45.130.1
  - b. 130.22.130.1
  - c. 130.12.64.23
  - d. 130.12.167.127
26. What class of IP address would be needed and what would the subnet mask be if you needed 20 different networks each supporting at least 500,000 hosts?

IP Address Class \_\_\_\_\_ ?  
Subnet Mask \_\_\_\_\_ ?

27. What class of IP address would be needed and what would the subnet mask be if you needed 3 different networks each supporting at least 78 hosts?

IP Address Class \_\_\_\_\_ ?  
Subnet Mask \_\_\_\_\_ ?

28. How many networks could be created with a Class B address and a subnet mask of 255.255.248.0? How many hosts could be supported per network?

Networks \_\_\_\_\_ ?  
Hosts per Network \_\_\_\_\_ ?

29. How many networks could be created with a Class A address and a subnet mask of 255.255.255.0? How many hosts could be supported per network?

Networks \_\_\_\_\_ ?  
Hosts per Network \_\_\_\_\_ ?

30. Is the host with address 131.107.73.15 on the same network as the host with address 131.107.127.37? The subnet mask is 255.255.252.0.

[Computer A]-----[Router]-----[Computer B]  
Interface    1            2            3            4

31. If Computer A wants to ping Computer B, to which number will Computer A send its ping?

End of Test

## TCP/IP Address and Subnetting Study Sheet

### (Answers)

1. IP Address = 128.12.34.71  
Subnet Mask = 255.255.255.0  
  
What is the subnet number?                   **0.0.34.0**  
Host number?                                   **0.0.0.71**
2. IP Address = 192.55.12.120  
Subnet Mask = 255.255.255.240  
  
What is the subnet number?                   **0.0.0.112**  
Host number?                                   **0.0.0.8**
3. What is the network address of a TCP/IP host that has an IP address of 203.23.32.34?  
**(203.23.32)**
4. What is the node (or host) address of a TCP/IP host that has an IP address of 182.23.32.34?  
**(32.34)**
5. What is the subnet mask for 184.231.138.239 if the first 10 bits of the node address is used for subnetting?  
  
255.255.192.0  
255.255.224.0  
255.255.255.224  
**255.255.255.192**
6. What are the two parts of an IP address?
  - a. network number and subnet number
  - b. network number and host number**
  - c. subnet number and host number
  - d. network number and dotted decimal
7. Which bits are set for all class B network numbers?  
the first bit is "0"
  - a. the first two bits are "10"**
  - b. the first three bits are "110"
  - c. the first four bits are "1110"
8. Which of the following class B network numbers is considered a private address?
  - a. 10.0.0.0
  - b. 192.168.1.0
  - c. 172.16.0.0**
  - d. 172.32.0.0
9. When the host field is set to "0", what does the address refer to?
  - a. the wire itself**
  - b. the first host of a subnet
  - c. the broadcast address
  - d. "0" is not a legal octet value
10. How many hosts are possible with 8-bit host field?
  - a. 253
  - b. 254**
  - c. 255

- d. 256
11. Using the first octet rule, what is the class of the IP address 172.16.4.2?
- a. A
  - b. B**
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  - d. D
12. Using the first octet rule, what is the class of the IP address 239.123.14.43?
- a. A
  - b. B
  - c. C
  - d. D**
13. What is the dotted decimal subnet mask represented by a /16 binary bit count?
- a. 255.255.255.255
  - b. 255.255.255.0
  - c. 255.255.0.0**
  - d. 255.0.0.0
14. What is the subnet portion of the IP address 172.16.4.162 with a subnet mask 255.255.255.0?
- a. 172.0.0.0
  - b. 172.16.0.0
  - c. 172.16.4.0**
  - d. 172.16.4.160
15. What is the subnet portion of the IP address 172.16.4.162 with a subnet mask 255.255.255.192?
- a. 172.16.4.0
  - b. 172.16.4.128**
  - c. 172.16.4.160
  - d. 172.16.4.164
16. What is the subnet portion of the IP address 172.16.4.164 with a subnet mask 255.255.255.224?
- a. 172.16.4.0
  - b. 172.16.4.128
  - c. 172.16.4.160**
  - d. 172.16.4.164
18. What is the first possible IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.0 lives?
- a. 172.16.4.1**
  - b. 172.16.4.33
  - c. 172.16.4.161
  - d. 172.16.4.163
19. What is the first possible IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.192 lives?
- a. 172.16.4.1
  - b. 172.16.4.129**
  - c. 172.16.4.161
  - d. 172.16.4.163

20. What is the first possible IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.224 lives?
- a. 172.16.4.1
  - b. 172.16.4.129
  - c. 172.16.4.161**
  - d. 172.16.4.163
21. What is the broadcast IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.0 lives?
- a. 172.16.4.1
  - b. 172.16.4.33
  - c. 172.16.4.161
  - d. 172.16.4.255**
22. What is the broadcast IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.192 lives?
- a. 172.16.4.1
  - b. 172.16.4.33
  - c. 172.16.4.191**
  - d. 172.16.4.255
23. What is the broadcast IP address on the subnet where the IP address 172.16.4.164 with a subnet mask 255.255.255.224 lives?
- a. 172.16.4.1
  - b. 172.16.4.63
  - c. 172.16.4.191**
  - d. 172.16.4.255
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  - b. 129.23.127.222**
  - c. 129.23.130.33
  - d. 129.23.148.127
25. Which IP address is located on the same subnet as 130.12.127.231 if the subnet mask is 255.255.192.0?
- a. 130.45.130.1
  - b. 10.22.130.1
  - c. 130.12.64.23**
  - d. 130.12.167.127
26. What class of IP address would be needed and what would the subnet mask be if you needed 20 different networks each supporting at least 500,000 hosts?
- IP Address Class **A**  
Subnet Mask 255.248.0.0
27. What class of IP address would be needed and what would the subnet mask be if you needed 3 different networks each supporting at least 78 hosts?
- IP Address Class **B**  
Subnet Mask 255.255.224.0

28. How many networks could be created with a Class B address and a subnet mask of 255.255.248.0? How many hosts could be supported per network?

Networks 30  
Hosts per Network 2,046

29. How many networks could be created with a Class A address and a subnet mask of 255.255.255.0? How many hosts could be supported per network?

Networks 65,534  
Hosts per Network 254

30. Is the host with address 131.107.73.15 on the same network as the host with address 131.107.127.37? The subnet mask is 255.255.252.0.

**Host 131.107.127.37 is Remote.**

31. [Computer A]-----[Router]-----[Computer B]  
Interface    1            2            3            4

If Computer A wants to ping Computer B, to which number will Computer A send its ping?  
**Computer A will send its ping to number 2 the local interface (Default Gateway).**

#### **About the Author**

Christine Cuellar is the Operations Director for Superior Solutions, Inc., a security assessment and training firm. Her duties include planning, logistics and operational management.