Binary To Decimal Conversion

128	64	32	16	8	4	2	1	Answers
1	0	0	1	0	0	1	0	146
0	1	1	1	0	1	1	1	119
1	1	1	1	1	1	1	1	255
1	1	0	0	0	1	0	1	197
1	1	1	1	0	1	1	0	246
0	0	0	1	0	0	1	1	19
1	0	0	0	0	0	0	1	129
0	0	1	1	0	0	0	1	49
0	1	1	1	1	0	0	0	120
1	1	1	1	0	0	0	0	240
0	0	1	1	1	0	1	1	59
0	0	0	0	0	1	1	1	7
						00011011		27
						10101010		170
						01101111		111
						11111000		248
						00100000		32
						01010101		85
						00111110		62
						00000011		3
						11101101		237
						11000000		192

Scratch Area

128 64
16 32
2 16
146 4
2
1
119

Decimal To Binary Conversion

Use all 8 bits for each problem

128	64	32	16	8	4	2	1	= 255
1	1	1	0	1	1	1	0	238
0	0	1	0	0	0	1	0	34
0	1	1	1	1	0	1	1	123
0	0	1	1	0	0	1	0	50
1	1	1	1	1	1	1	1	255
1	1	0	0	1	0	0	0	200
0	0	0	0	1	0	1	0	10
1	0	0	0	1	0	1	0	138
0	0	0	0	0	0	0	1	1
0	0	0	0	1	1	0	1	13
1	1	1	1	1	0	1	0	250
0	1	1	0	1	0	1	1	107
1	1	1	0	0	0	0	0	224
0	1	1	1	0	0	1	0	114
1	1	0	0	0	0	0	0	192
1	0	1	0	1	1	0	0	172
0	1	1	0	0	1	0	0	100
0	1	1	1	0	1	1	1	119
0	0	1	1	1	0	0	1	57
0	1	1	0	0	0	1	0	98
1	0	1	1	0	0	1	1	179
0	0	0	0	0	0	1	0	2

Scratch Area

```
238
-128
110
-64
 46
-32
 14
 -8
  6
 -4
  2
 -2
  0
```

```
34
-32
 2
-2
 0
```

Address Class Identification

Address	Class
10.250.1.1	A
150.10.15.0	B
192.14.2.0	C
148.17.9.1	B
193.42.1.1	C
126.8.156.0	A
220.200.23.1	C
230.230.45.58	D
177.100.18.4	B
119.18.45.0	A
249.240.80.78	E
199.155.77.56	C
117.89.56.45	A
215.45.45.0	C
199.200.15.0	C
95.0.21.90	A
33.0.0.0	A
158.98.80.0	B
219.21.56.0	C

Network & Host Identification

Circle the network portion of these addresses:

177.100.18.4

119.18.45.0

209.240.80.78

199.155.77.56

117.89.56.45

215.45.45.0

192.200.15.0

95.0.21.90

33.0.0.0

158.98.80.0

217.21.56.0

10.250.1.1

150.10.15.0

192.14.2.0

148.17.9.1

193.42.1.1

126.8.156.0

220.200.23.1

Circle the host portion of these addresses:

10.15.123.50

171.2.199.31

198.125.87.177

223.250.200.222

17.45.222.45

126.201.54.231

191.41.35.112

155.25.169.227

192.15.155.2

123.102.45.254

148.17.9.155

100.25.1.1

195.0.21.98

25.250.135.46

171.102.77.77

55.250.5.5

218.155.230.14

10.250.1.1

Network Addresses

Using the IP address and subnet mask shown write out the network address:

188.10.18.2 255.255.0.0	188.10.0.0
10.10.48.80 255.255.255.0	10.10.48.0
192.149.24.191 255.255.255.0	192.149.24.0
150.203.23.19 255.255.0.0	150.203.0.0
10.10.10.10 255.0.0.0	10.0.0.0
186.13.23.110 255.255.255.0	186.13.23.0
223.69.230.250 255.255.0.0	223.69.0.0
200.120.135.15 255.255.255.0	200.120.135.0
27.125.200.151 255.0.0.0	27.0.0.0
199.20.150.35 255.255.255.0	199.20.150.0
191.55.165.135 255.255.255.0	191.55.165.0
28.212.250.254 255.255.0.0	28.212.0.0

Host Addresses

Using the IP address and subnet mask shown write out the host address:

188.10.18.2 255.255.0.0	0.0.18.2
10.10.48.80 255.255.255.0	0.0.0.80
222.49.49.11 255.255.255.0	0.0.0.11
128.23.230.19 255.255.0.0	0.0.230.19
10.10.10.10 255.0.0.0	0.10.10.10
200.113.123.11 255.255.255.0	0.0.0.11
223.169.23.20 255.255.0.0	0.0.23.20
203.20.35.215 255.255.255.0	0.0.0.215
117.15.2.51 255.0.0.0	0.15.2.51
199.120.15.135 255.255.255.0	0.0.0.135
191.55.165.135 255.255.255.0	0.0.0.135
48.21.25.54 255.255.0.0	0.0.25.54

Default Subnet Masks

Write the correct default subnet mask for each of the following addresses:

177.100.18.4	255.255.0.0
119.18.45.0	255.0.0.0
191.249.234.191	255.255.0.0
223.23.223.109	255.255.255.0
10.10.250.1	255.0.0.0
126.123.23.1	255.0.0.0
223.69.230.250	255.255.255.0
192.12.35.105	255.255.255.0
77.251.200.51	255.0.0.0
189.210.50.1	255.255.0.0
88.45.65.35	255.0.0.0
128.212.250.254	255.255.0.0
193.100.77.83	255.255.255.0
125.125.250.1	255.0.0.0
1.1.10.50	255.0.0.0
220.90.130.45	255.255.255.0
134.125.34.9	255.255.0.0
95.250.91.99	255.0.0.0

Custom Subnet Masks

Problem 4

Number of needed subnets **6**
Number of needed usable hosts **30**
Network Address **210.100.56.0**

Address class C

Default subnet mask 255.255.255.0

Custom subnet mask 255.255.255.224

Total number of subnets 8

Total number of host addresses 32

Number of usable addresses 30

Number of bits borrowed 3

Show your work for Problem 4 in the space below.

Number of Subnets	256	128	64	32	16	8	4	2	- Number of Hosts
-	2	4	8	16	32	64	128	256	
	128	64	32	16	8	4	2	1	- Binary values
210 . 100 . 56 .	0	0	0	0	0	0	0	0	

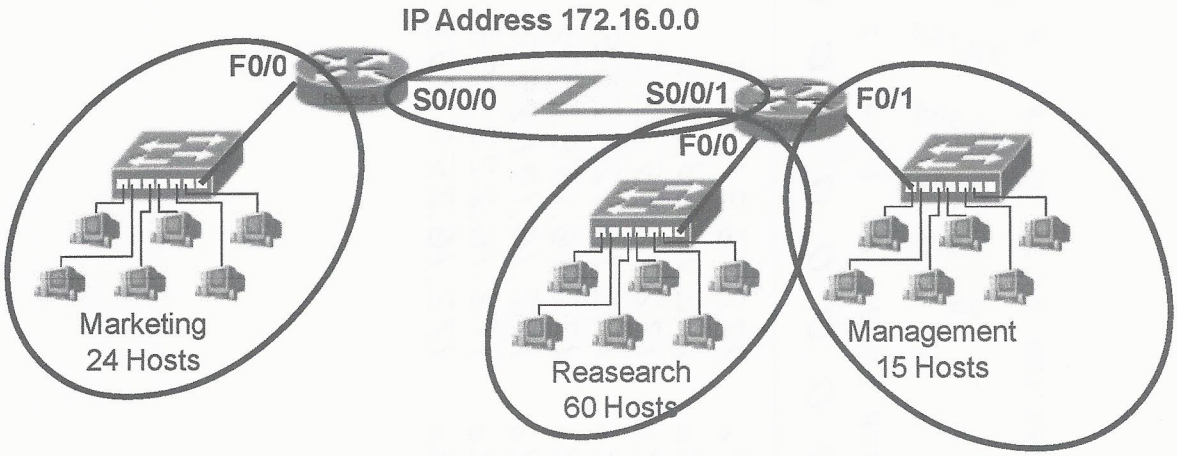
1 1
128
64
+ 32
224

8
- 2
6

32
- 2
30

Practical Subnetting 1

Based on the information in the graphic shown, design a network addressing scheme that will supply the **minimum number of subnets**, and allow enough extra subnets and hosts for 100% growth in both areas. Circle each subnet on the graphic and answer the questions below.



Address class	B
Custom subnet mask	255.255.224.0
Minimum number of subnets needed	4
Extra subnets required for 100% growth (Round up to the next whole number)	+ 4
Total number of subnets needed	= 8
Number of host addresses in the largest subnet group	60
Number of addresses needed for 100% growth in the largest subnet (Round up to the next whole number)	+ 60
Total number of address needed for the largest subnet	= 120

Start with the first subnet and arrange your sub-networks from the largest group to the smallest.

IP address range for Research	172.16.0.0 to 172.31.255
IP address range for Marketing	172.16.32.0 to 172.63.255
IP address range for Management	172.16.64.0 to 172.95.255
IP address range for Router A to Router B serial connection	172.16.96.0 to 172.127.255

Show your work for Practical Subnetting 1 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	4,096	8,192	16,384	32,768	65,536
Binary values –			128	64	32	16	8	4	2	1	.	128	64	32	16	8	4	2	1
172	. 16	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0

(1)			0	172.16.0.0	to	172.16.31.255
(2)			1	172.16.32.0	to	172.16.63.255
(3)		1	0	172.16.64.0	to	172.16.95.255
(4)		1	1	172.16.96.0	to	172.16.127.255
(5)	1	0	0	172.16.128.0	to	172.16.159.255
(6)	1	0	1	172.16.160.0	to	172.16.191.255
(7)	1	1	0	172.16.192.0	to	172.16.223.255
(8)	1	1	1	172.16.224.0	to	172.16.255.255

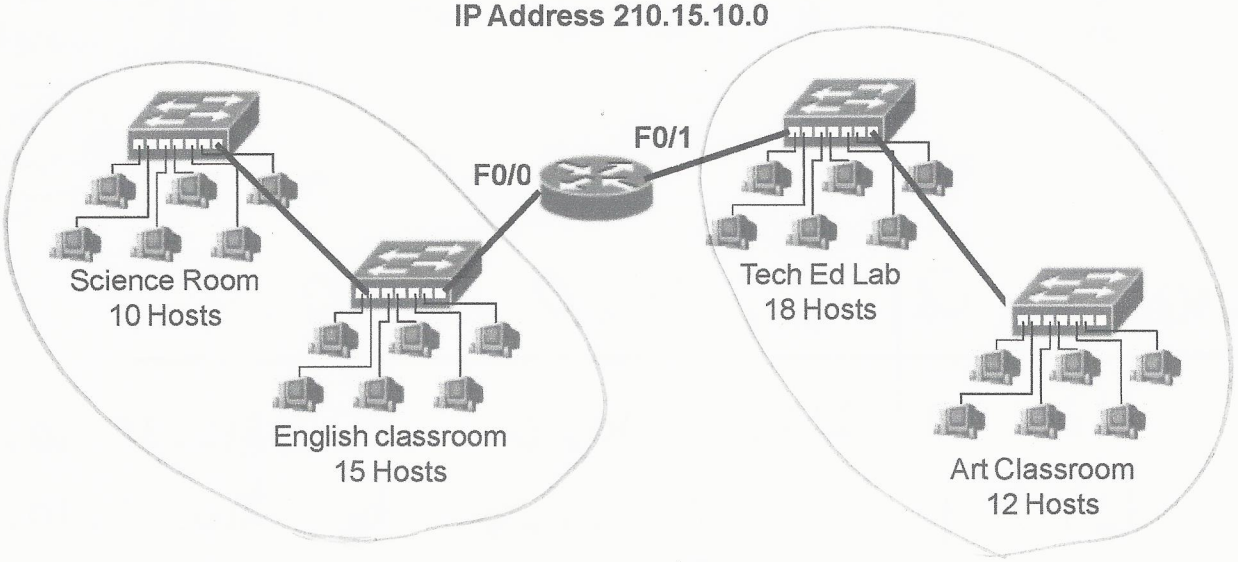
$$\begin{array}{r} 4 \\ \times 1.0 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 60 \\ \times 1.0 \\ \hline 60 \end{array}$$

Practical Subnetting 5

Based on the information in the graphic shown, design a network addressing scheme that will supply the **minimum number of hosts per subnet**, and allow enough extra subnets and hosts for 100% growth in all areas. Circle each subnet on the graphic and answer the questions below.

IP Address 210.15.10.0



Address class C

Custom subnet mask 255. 255. 255. 192

Minimum number of subnets needed 2

Extra subnets required for 100% growth + 2
(Round up to the next whole number)

Total number of subnets needed = 4

Number of host addresses in the largest subnet group 30

Number of addresses needed for 100% growth in the largest subnet + 30
(Round up to the next whole number)

Total number of address needed for the largest subnet = 60

Start with the first subnet and arrange your sub-networks from the largest group to the smallest.

IP address range for Router F0/0 Port 210. 15. 10. 0 to 210. 15. 10. 63

IP address range for Router F0/1 Port 210. 15. 10. 64 to 210. 15. 10. 127

Show your work for <u>Problem 5</u> in the space below.

	256	128	64	32	16	8	4	2 ← # of Hosts
	2	4	8	16	32	64	128	256 ← # of Subnets
	128	64	32	16	8	4	2	1 ← Binary
210.15.10.0	0	0	0	0	0	0	0	0

(1)	0	210.15.10.0	to	210.15.10.63
(2)	1	210.15.10.64	to	210.15.10.127
(3)	1 0	210.15.10.128	to	210.15.10.191
(4)	1 1	210.15.10.192	to	210.15.10.255