

1.

Step	Confirmed	Tentative
1	(A,0,-)	
2	(A,0,-)	(B,2,B) (C,7,C)
3	(A,0,-) (B,2,B)	(E,5,B) (D,7,B) (C,7,C)
4	(A,0,-) (B,2,B) (E,5,B)	(D,6,B) (C,7,C) (F,7,B)
5	(A,0,-) (B,2,B) (E,5,B) (D,6,B)	(C,7,C) (F,7,B)
6	(A,0,-) (B,2,B) (E,5,B) (D,6,B) (F,7,B)	(C,7,C)
7	(A,0,-) (B,2,B) (E,5,B) (D,6,B) (C,7,C)	

2. A: 233.255.10.0/24

B: 255.255.10.8/25

C: 255.255.10.1/25

3.

- a.
1. 128.174.224.0 Router 3
  2. 128.174.254.7 Interface 3
  3. 128.174.252.0 /23 Interface 2
  4. 128.174.224.0 Router 3
  5. default
  6. 128.174.254.16 Router 1

- b.
1. 0, since 20 bits mask cannot get ".248"
  2.  $2^{(32-26)} = 64$
  3.  $2^{(32-23)} = 512$
  4. 1, there's no mask
  5.  $2^{(32-28)} = 16$
  6.  $2^{(32-19)} = 8192$
  7.  $2^{32}$ , because all bits can be used

4. a.  $k+k^2+k^3+k^4+\dots+k^N = k(k^N-1)/(k-1)$   
 b.  $N \cdot k^N$   
 c. if sending a fraction of unicasts:  
 $t1 = f \cdot N \cdot k^N$   
 if sending a multicast:  
 $t2 = k(k^N-1)/(k-1)$   
 $t1 = t2$   
 $f \cdot N \cdot k^N = k(k^N-1)/(k-1)$   

$$f = \frac{k(k^N-1)}{(k-1) \cdot N \cdot k^N}$$
5. a.  $P = 1 - (0.9)^8 = 0.5695$   
 if transmitted twice,  
 b.  $0.5695^2 = 0.3243$   
 c. every fragment can be transmitted twice  
 $P = 1 - (1 - 0.01)^8 = 0.0773$   
 d. Ident is for labeling every fragment. With this field, the receiver can recover the packet using a new fragment from the second packet.
6. eth0 Link encap:Ethernet HWaddr 08:00:27:f7:e8:42  
 inet addr:10.0.2.15 Bcast:10.0.2.255 Mask:255.255.255.0  
 inet6 addr: fe80::a00:27ff:fe77:e842/64 Scope:Link  
 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  
 RX packets:30 errors:0 dropped:0 overruns:0 frame:0  
 TX packets:82 errors:0 dropped:0 overruns:0 carrier:0  
 collisions:0 txqueuelen:1000  
 RX bytes:3930 (3.9 KB) TX bytes:11846 (11.8 KB)

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lo    Link encap:Local Loopback
      inet addr:127.0.0.1  Mask:255.0.0.0
      inet6 addr: ::1/128 Scope:Host
      UP LOOPBACK RUNNING  MTU:65536  Metric:1
      RX packets:50 errors:0 dropped:0 overruns:0 frame:0
      TX packets:50 errors:0 dropped:0 overruns:0 carrier:0
      collisions:0 txqueuelen:0
      RX bytes:3871 (3.8 KB)  TX bytes:3871 (3.8 KB)
```