

Name: \_\_\_\_\_

Rules to know:

If you need a certain number of networks IPs, "borrow the bits" from left to right.

If you need a certain number of host IPs, leave enough "bits left over" from right to left and subtract 2.

$$2^x - 2 = \text{number of bits needed for host IPs.}$$

Exercise: Draw a vertical line where either the bits are borrowed, or where they are left over.

1. I need 16 network IPs. How many bits do I need to borrow?  
o o o o o o o o
2. I need 16 host IPs. How many bits do I need to have left over?  
o o o o o o o o
3. I need 8 network IPs. How many bits do I need to borrow?  
o o o o o o o o
4. I need 8 host IPs. How many bits do I need to have left over?  
o o o o o o o o
5. I need 32 network IPs. How many bits do I need to borrow?  
o o o o o o o o
6. I need 32 host IPs. How many bits do I need to have left over?  
o o o o o o o o
7. I need 25 network IPs. How many bits do I need to borrow?  
o o o o o o o o
8. I need 25 host IPs. How many bits do I need to have left over?  
o o o o o o o o
9. I need 9 network IPs. How many bits do I need to borrow?  
o o o o o o o o
10. I need 9 host IPs. How many bits do I need to have left over?  
o o o o o o o o
11. I need 30 network IPs. How many bits do I need to borrow?  
o o o o o o o o
12. I need 30 host IPs. How many bits do I need to have left over?  
o o o o o o o o
13. I need 20 network IPs. How many bits do I need to borrow?  
o o o o o o o o
14. I need 40 host IPs. How many bits do I need to have left over?  
o o o o o o o o
15. I need 17 network IPs. How many bits do I need to borrow?  
o o o o o o o o
16. I need 65 host IPs. How many bits do I need to have left over?  
o o o o o o o o
17. I need 100 network IPs. How many bits do I need to borrow?  
o o o o o o o o
18. I need 100 host IPs. How many bits do I need to have left over?  
o o o o o o o o