We have to update the cheat sheet to solve for the second and third octet too:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 | Represents group size |
| 128 | 192 | 224 | 240 | 248 | 252 | 254 | 255 | Represents subnet mask |
| /25 | /26 | /27 | /28 | /29 | /30 | /31 | /32 | Represents CIDR |
| /17 | /18 | /19 | /20 | /21 | /22 | /23 | /24 | 3rd octet |
| /9 | /10 | /11 | /12 | /13 | /14 | /15 | /16 | 2nd octet |
| /1 | /2 | /3 | /4 | /5 | /6 | /7 | /8 | 1st octet |

Lets solve for the second octet with this target IP address: 10.50.111.222 /12. We can see that the CIDR is /12 so the subnet mask would be 255.240.0.0. The group size is 16 so that’s our increment.

A red and green numbers

AI-generated content may be incorrect.

Now we can solve as normal. The network ID is 10.48.0.0. The next network is 10.64.0.0. The broadcast IP is 10.63.255.255. The last host IP is 10.63.255.254. The first host IP is 10.48.0.1. the number of IP addresses is 2^(32-CIDR) so 1048576 (1048574 usable)

Network ID: 10.48.0.0

Broadcast IP: 10.63.255.255

First Host IP: 10.48.0.1

Last Host IP: 10.63.255.254

Next Network: 10.64.0.0

Number of IP addresses: 1048576 (1048574 usable)

CIDR/Subnet: /12 ---> 255.240.0.0

Now we will solve for the first octet with this target IP address: 10.50.111.222 /7. We can see that the CIDR is /7 so the subnet mask would be 254.0.0.0. The group size is 2 so that is our increment:

A screenshot of a number

AI-generated content may be incorrect.

Now we solve as normal, the network ID is 10.0.0.0. The next network is 12.0.0.0. The broadcast IP is 11.255.255.255. The last host IP is 11.255.255.254. the first host IP is 10.0.0.1. The number of IP addresses is 2^(32-CIDR) so 33554432 (33554430 usable).

Network ID: 10.0.0.0

Broadcast IP: 11.255.255.255

First Host IP: 10.0.0.1

Last Host IP: 11.255.255.254

Next Network: 12.0.0.0

Number of IP addresses: 33554432 (33554430 usable)

CIDR/Subnet: /7 ---> 254.0.0.0

Now lets solve for 213.50.111.222 /2. We can see that the CIDR is /2, so the subnet mask is 192.0.0.0. The group size is 64 so that is our increment:

A green and red numbers and a white background

AI-generated content may be incorrect.

256 is not a valid IP address, we also cant increase the next octet because there isn’t an octet before the first.

A screenshot of a graph

AI-generated content may be incorrect.

This image is every IP address in the IPv4 internet, starting from 0.0.0.0 to 255.255.255.255.

This is referred to as a /0 network. If we were to split this into 2 parts, we would have 2 equal /1 subnets:

A screenshot of a video game

AI-generated content may be incorrect.

Then we could split it into 4 equal parts, and we’d have 4 equal /2 subnets.

A screenshot of a computer

AI-generated content may be incorrect.

When we were doing our increments of 64 each time in the first octet, we were listing out the first IP address in each sub-network. The target IP address was in the 4th subnet. We can see that when we incremented and marked out 192, that was the network ID as seen in the image too. Since there isn’t another /2 block , it is the last one meaning that the next network is n/a. then the broadcast IP would be 255.255.255.255, the last host IP would be 255.255.255.254. the first host IP would be 192.0.0.1. The total IP addresses would be 2^(32-CIDR) so 1073741824 (1073741822 usable).

Network ID: 192.0.0.0

Broadcast IP: 255.255.255.255

First Host IP: 192.0.0.1

Last Host IP: 255.255.255.254

Next Network: n/a

Number of IP addresses: 1073741824 (1073741822 usable)

CIDR/Subnet: /2 ---> 192.0.0.0