Subnetting Cheat Sheet

3rd octet: /16 → /23 (255.255.x.0)

CIDR	x	Block	Hosts
/16	0	256	65,534
/17	128	128	32,766
/18	192	64	16,382
/19	224	32	8,190
/20	240	16	4,094
/21	248	8	2,046
/22	252	4	1,022
/23	254	2	510

4th octet: /24 → /32 (255.255.255.x)

CIDR	x	Block	Hosts
/24	0	256	254
/25	128	128	126
/26	192	64	62
/27	224	32	30
/28	240	16	14
/29	248	8	6
/30	252	4	2
/31	254	2	2*
/32	255	1	1

*/31 = point-to-point, both usable (RFC 3021)
wildcard octet = block − 1 · /8–/15: same in the 2nd octet

VLSM in 4 steps

1. sort biggest → smallest
2. hosts + 2 → next power of 2
3. place at next free multiple
4. leave room to grow!

Powers of 2

2^1 2^2 2^3 2^4 2^5 2^6 2^7 2^8 2^9
2^{10} 2^{11} 2^{12}

The magic number

block size = 256 − interesting octet
/27 → 256 − 224 = **32**
/20 → 256 − 240 = **16** (3rd octet!)

Subnet it in your head

192.168.10.77/26
1. block = 256 − 192 = **64**
2. 0, 64, 128 … 77 lives in **64–127**
3. net **.64** · bcast **.127** · hosts .65–.126

10.1.77.200/20 ← *3rd octet!*
1. block = 256 − 240 = **16**
2. 77 ÷ 16 = 4 r13 → **64**
3. net **10.1.64.0** · bcast **10.1.79.255**

Private & special

10/8 · **172.16/12** · **192.168/16** private
100.64/10 CGNAT · **169.254/16** no DHCP
127/8 loopback · **224/4** multicast
docs: **192.0.2/24** · **198.51.100/24** · **203.0.113/24**

watch out: 172.32.x.x is PUBLIC