

Subnetting cheat sheet: /8 to /32

Usable hosts = $2^{\text{host bits}}$ minus 2
Block size = 256 minus the mask octet

Bit values: the only row to memorise

Mask values: add the bits left to right

128	64	32	16	8	4	2	1	128	192	224	240	248	252	254	255
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Powers of 2: 2^1 2 2^2 4 2^3 8 2^4 16 2^5 32 2^6 64 2^7 128 2^8 256 2^{10} 1,024 2^{12} 4,096 2^{16} 65,536

CIDR	Subnet mask	Wildcard	Addresses	Usable hosts	Block size	Subnets in a /24
/8	255.0.0.0	0.255.255.255	16,777,216	16,777,214	1 1st	
/9	255.128.0.0	0.127.255.255	8,388,608	8,388,606	128 2nd	
/10	255.192.0.0	0.63.255.255	4,194,304	4,194,302	64 2nd	
/11	255.224.0.0	0.31.255.255	2,097,152	2,097,150	32 2nd	
/12	255.240.0.0	0.15.255.255	1,048,576	1,048,574	16 2nd	
/13	255.248.0.0	0.7.255.255	524,288	524,286	8 2nd	
/14	255.252.0.0	0.3.255.255	262,144	262,142	4 2nd	
/15	255.254.0.0	0.1.255.255	131,072	131,070	2 2nd	
/16	255.255.0.0	0.0.255.255	65,536	65,534	1 2nd	
/17	255.255.128.0	0.0.127.255	32,768	32,766	128 3rd	
/18	255.255.192.0	0.0.63.255	16,384	16,382	64 3rd	
/19	255.255.224.0	0.0.31.255	8,192	8,190	32 3rd	
/20	255.255.240.0	0.0.15.255	4,096	4,094	16 3rd	
/21	255.255.248.0	0.0.7.255	2,048	2,046	8 3rd	
/22	255.255.252.0	0.0.3.255	1,024	1,022	4 3rd	
/23	255.255.254.0	0.0.1.255	512	510	2 3rd	
/24	255.255.255.0	0.0.0.255	256	254	1 3rd	1
/25	255.255.255.128	0.0.0.127	128	126	128 4th	2
/26	255.255.255.192	0.0.0.63	64	62	64 4th	4
/27	255.255.255.224	0.0.0.31	32	30	32 4th	8
/28	255.255.255.240	0.0.0.15	16	14	16 4th	16
/29	255.255.255.248	0.0.0.7	8	6	8 4th	32
/30	255.255.255.252	0.0.0.3	4	2	4 4th	64
/31	255.255.255.254	0.0.0.1	2	2*	2 4th	128
/32	255.255.255.255	0.0.0.0	1	1*	1 4th	256

Highlighted: /24 to /30, the rows most exam questions use. *A /31 uses both addresses on a point-to-point link (RFC 3021); a /32 is a single host route. Cloud subnets reserve more: AWS and Azure 5 per subnet, Google Cloud 4.

Private and special ranges

10.0.0.0/8	Private	RFC 1918
172.16.0.0/12	Private	RFC 1918
192.168.0.0/16	Private	RFC 1918
100.64.0.0/10	Shared address space (carrier-grade NAT)	RFC 6598
169.254.0.0/16	Link-local	RFC 3927
127.0.0.0/8	Loopback	RFC 1122
192.0.2.0/24	Documentation (TEST-NET-1)	RFC 5737
198.51.100.0/24	Documentation (TEST-NET-2)	RFC 5737
203.0.113.0/24	Documentation (TEST-NET-3)	RFC 5737
224.0.0.0/4	Multicast	RFC 5771

IPv6 prefixes

/32	Typical allocation to an ISP	4,294,967,296 /64s
/48	Typical site or organisation allocation	65,536 /64s
/56	Typical home or small-office delegation	256 /64s
/64	One LAN segment (SLAAC needs a /64)	1 /64s
/127	Point-to-point link (RFC 6164)	
/128	Single host or loopback	