

Number of Characters	Numbers Only	Lowercase Letters	Upper and Lowercase Letters	Numbers, Upper and Lowercase Letters	Numbers, Upper and Lowercase Letters, Symbols
4	Instantly	Instantly	Instantly	Instantly	Instantly
5	Instantly	Instantly	Instantly	Instantly	Instantly
6	Instantly	Instantly	Instantly	1 sec	5 secs
7	Instantly	Instantly	25 secs	1 min	6 mins
8	Instantly	5 secs	22 mins	1 hour	8 hours
9	Instantly	2 mins	19 hours	3 days	3 weeks
10	Instantly	58 mins	1 month	7 months	5 years
11	2 secs	1 day	5 years	41 years	400 years
12	25 secs	3 weeks	300 years	2k years	34k years
13	4 mins	1 year	16k years	100k years	2m years
14	41 mins	51 years	800k years	9m years	200m years
15	6 hours	1k years	43m years	600m years	15 bn years
16	2 days	34k years	2bn years	37bn years	1tn years
17	4 weeks	800k years	100bn years	2tn years	93tn years
18	9 months	23m years	6tn years	100 tn years	7qd years

**TIME IT TAKES
A HACKER TO
BRUTE FORCE
YOUR
PASSWORD**

4 10,000

731,616

78,074,896

numbers 10

8 100,000,000

52⁸

94⁸

upper+lower 52

symbols 32

94

12 10¹²

52¹²

94¹²

16 10¹⁶

52¹⁶
2.9 × 10²⁷

94¹⁶
3.7 × 10³¹

$$\begin{aligned} & 1.27 \times 10^{27} \\ & \frac{3.7 \times 10^{31}}{2.9 \times 10^{27}} \\ & = 1.27 \times 10^4 \\ & = 12,700 \end{aligned}$$

$$\frac{2.9 \cdot 10^{27}}{10^{16}}$$

Exponentials

$$\frac{10}{10} \cdot \frac{10}{10} \cdot \frac{10}{10} \cdot \frac{10}{10} = 10^4$$

$$\frac{10}{10} \cdot \frac{10}{10} \cdot \frac{10}{10} \cdot \frac{10}{10} \cdot \frac{10}{10} \cdot \frac{10}{10} = 10^8$$

$$52 \cdot 52 \cdot 52 \cdot 52 = 52^4$$

$$\sqrt{94} \cdot 94 \cdot 94 \cdot 94 = 78,074,896$$

10⁶ mil

10⁹ bill

10¹² trill