

Probability Questions are often
Just two counting questions.

SO... Let's Count!

Exercise 1.2-1 52 possible characters

4 Character Passwords

$$\underline{52} \cdot \underline{52} \cdot \underline{52} \cdot \underline{52} = 52^4$$

Product Principle

5	6	7	8 char. Pwds
52^5	52^6	52^7	52^8

Sum Principle.

Answer: $52^4 + 52^5 + 52^6 + 52^7 + 52^8$
 $52^8 = 5,218,723,368,656$

To find the percentage:

$$\frac{52^4}{52^4 + 52^5 + 52^6 + 52^7 + 52^8}$$

Estimate: $\hat{\approx} \frac{52^4}{52^8} = \frac{1}{52^4}$

$.000000137 = \text{small}$