Steve Homer
Math 475

OR

Homework assigned 2/1

11) Suppose a seven-letter word made up from $\{a, b, c\}$ is chosen at random. What is the probability of exactly 3 a's?

S = set of seven-letter words E = words w/ exactly 3 a's

$|S| = 3^7$ $|E| = \binom{7}{3} = \frac{7 \cdot 6 \cdot 5}{3 \cdot 2 \cdot 1} = 35$ ways to place 'a' $\times$ $16 = 2^4 \rightarrow$ b or c for remaining 4 places

$35 \times 16 = 560$

$$\text{Prob}(E) = \frac{|E|}{|S|} = \boxed{\frac{560}{2187}}$$