Discrete Mathematics Counting and Probability

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Bijection
and
the k-to-1 Rule

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Example. $A = \{x, y, z\}$.

1. Establish a 1-to-1 correspondence between $P(A)$ and $\{0,1\}^3$.
2. Count $P(A)$ by counting $\{0,1\}^3$.

The k-to-1 Rule

$f : X \to Y$ is a *k-to-1 correspondence* if for every $y \in Y$, there are exactly k different $x \in X$ such that $f(x) = y$. In that case, $|Y| = \frac{|X|}{k}$, or $|X| = k|Y|$.

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Example. $X = \{0,1,2,3,4,5\}$, $Y = \{0,1\}$ and $y = f(x) = \left\lfloor \frac{x}{3} \right\rfloor$.