

# Random variables

Probabilities are useful even when they do not deal strictly with events. It often occurs that we measure something that has randomness associated with it. We use random variables to represent these measurements.

A **random variable** is a function that maps from the sample space to the real numbers,  $X: \Omega \rightarrow \mathbb{R}$ .

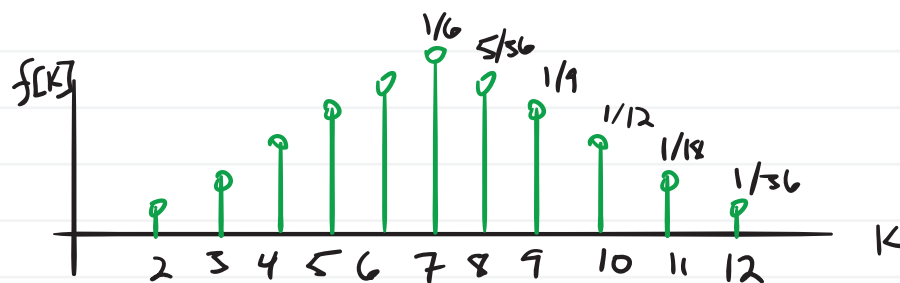


**Note:** random variables will be denoted with capital letters (e.g.  $X$  and  $K$ ) and specific values that they map to (the "image" of a r.v.) will be denoted with lowercase letters (e.g.  $x$  and  $k$ ).

## Discrete random variables

Discrete random variables take on discrete values.

**Example** Roll two unbiased dice. Let  $K$  be a r.v. representing the sum of the two. Draw the results.



## Continuous random variables

Just like discrete, but take on values in a continuum.