

# Probability mass and probability density

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- Explain the meaning of the term probability mass function.
- Suppose that we use the random variable  $X$  to denote the outcome of a toss of a fair coin and that we say that if the coin comes up heads we have  $X = 0$  and if the coin comes up tails we have  $X = 1$ . What is the probability mass function for this random variable.
- Now suppose that the random variable  $X$  is used to denote the outcome from a roll of a fair die. Write out an expression for the probability mass function for this random variable. Now draw the probability distribution function for this random variable and write out a mathematical expression for this function. As you do this remember that the probability distribution function must have a value for every number on the real axis.
- Explain the meaning of the term probability density function?



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- Do the random variables for the coin and the die have a probability density function. Explain your reasoning giving as much detail as you can.
- Explain what we mean when we state that discrete and continuous random variables are normalised.
- In the final parts of the video I introduce the uniform random variable. Given the shape of the curves on these slides what are the probability density and the probability distribution function for this random variable?