	One random variable, X		Two joint random variables (X,Y)	
	Discrete	Continuous	Discrete	Continuous
Probability mass/density	pmf: $p_X(x)$	pdf: $f_X(x)$	$p_{X,Y}(x,y)$	$f_{X,Y}(x,y)$
function	$= P(X=x)$	$(P(X=x) \equiv 0)$	$= P(X=x, Y=y)$	
defined for	all x with $p_X(x) > 0$	$-\infty < x < \infty$		$-\infty < x < \infty, \ -\infty < y < \infty$
Probability $P(X \in A)$	$\sum_{x \in A} p_X(x)$	$\int_{x \in A} f_X(x)dx$	$\sum\sum_{(x,y)\in A} p_{X,Y}(x,y)$	$\int\int_{(x,y)\in A} f_{X,Y}(x,y)dxdy$
Note:	$p_X(x) \geq 0$	$f_X(x) \geq 0$	$p_{X,Y}(x,y) \geq 0$	$f_{X,Y}(x,y) \geq 0$
	$\sum_x p_X(x) = 1$	$\int_x f_X(x)dx = 1$	$\sum_x \sum_y p_{X,Y}(x,y) = 1$	$\int_x \int_y f_{X,Y}(x,y)dxdy = 1$
Cumulative distrib. func.	$F_X(x) = \sum_{z \leq x} p_X(z)$	$F_X(x) = \int_{-\infty}^{x} f_X(z)dz$	$F_{X,Y}(x,y) = P(X \leq x, Y \leq y)$	
cdf, $F_X(x) = P(X \leq x)$			$\sum_{z \leq x, w \leq y} p_{X,Y}(z,w)$	$\int_{z=-\infty}^{x} \int_{w=-\infty}^{y} f_{X,Y}(z,w)dz\ dw$
Result:	$P(a < X \leq b) = F_X(b) - F_X(a)$		$P(a_1 < X \leq a_2,\ b_1 < Y \leq b_2) =$	
			$F_{X,Y}(a_2,b_2) - F_{X,Y}(a_1,b_2) - F_{X,Y}(a_2,b_1) + F_{X,Y}(a_1,b_1)$	
From cdf to pdf		$f_X(x) = \frac{d}{dx} F_X(x)$		$f_{X,Y}(x,y) = \frac{\partial^2}{\partial x\ \partial y} F_{X,Y}(x,y)$
Marginal pmf/pdf			$p_X(x) = \sum_y p_{X,Y}(x,y)$	$f_X(x) = \int_y f_{X,Y}(x,y)dy$
			$p_Y(y) = \sum_x p_{X,Y}(x,y)$	$f_Y(y) = \int_x f_{X,Y}(x,y)dx$
Expectation $\mathrm{E}(X)$	$\sum_x x p_X(x)$	$\int_{-\infty}^{\infty} x f_X(x)dx$		
Result: $\mathrm{E}(g(X))$	$\sum_x g(x) p_X(x)$	$\int_{-\infty}^{\infty} g(x) f_X(x)dx$	$\sum_x \sum_y g(x,y) p_{X,Y}(x,y)$	$\int_x \int_y g(x,y) f_{X,Y}(x,y)dx\ dy$
Consequence:	$\mathrm{E}(g_1(X) + g_2(X)) = \mathrm{E}(g_1(X)) + \mathrm{E}(g_2(X))$		$\mathrm{E}(g_1(X) + g_2(Y)) = \mathrm{E}(g_1(X)) + \mathrm{E}(g_2(Y))$	