Formulário 2021/22

$P(X=x)=\binom{n}{x}p^x(1-p)^{n-x}$ $x=0,1,\ldots,n$ $E(X)=np \qquad Var(X)=np(1-p)$	$P(X=x)=\frac{e^{-\lambda}\lambda^x}{x!}$ $x=0,1,\ldots$ $E(X)=Var(X)=\lambda$	$P(X=x)=p(1-p)^{x-1}$ $x=1,2,\ldots$ $E(X)=\frac{1}{p} \qquad Var(X)=\frac{(1-p)}{p^2}$
$f_X(x)=\frac{1}{b-a},\ a\leq x\leq b$	$E(X)=\frac{b+a}{2}$	$Var(X)=\frac{(b-a)^2}{12}$
$f_X(x)=\frac{1}{\sqrt{2\pi\sigma^2}}\exp\left\{-\frac{(x-\mu)^2}{2\sigma^2}\right\},\ x\in I\!R$	$E(X)=\mu$	$Var(X)=\sigma^2$
$f_X(x)=\lambda e^{-\lambda x},\ x\geq 0$	$E(X)=\frac{1}{\lambda}$	$Var(X)=\frac{1}{\lambda^2}$

$\frac{\bar{X}-\mu}{\sigma/\sqrt{n}}\sim N(0,1)$	$\frac{\bar{X}-\mu}{S/\sqrt{n}}\sim t_{(n-1)}$	$\frac{\bar{X}-\mu}{S/\sqrt{n}}\overset{a}{\sim} N(0,1)$
$S^2=\frac{1}{n-1}\sum_{i=1}^{n}\left(X_i-\bar{X}\right)^2$	$\frac{(n-1)S^2}{\sigma^2}\sim\chi^2_{(n-1)}$	$\sum_{i=1}^{k}\frac{(O_i-E_i)^2}{E_i}\overset{a}{\sim}_{H_0}\chi^2_{(k-\beta-1)}$

$Y_i=\beta_0+\beta_1x_i+\varepsilon_i$	$\hat{\beta}_0=\bar{Y}-\hat{\beta}_1\bar{x}$	$\hat{\beta}_1=\frac{\sum_{i=1}^{n}x_iY_i-n\bar{x}\bar{Y}}{\sum_{i=1}^{n}x_i^2-n\bar{x}^2}$
$\hat{\sigma}^2=\frac{1}{n-2}\sum_{i=1}^{n}\left(Y_i-\hat{Y}_i\right)^2,\ \hat{Y}_i=\hat{\beta}_0+\hat{\beta}_1x_i$	$\hat{\sigma}^2=\frac{1}{n-2}\left[\left(\sum_{i=1}^{n}Y_i^2-n\bar{Y}^2\right)-\left(\hat{\beta}_1\right)^2\left(\sum_{i=1}^{n}x_i^2-n\bar{x}^2\right)\right]$	
$\frac{\hat{\beta}_0-\beta_0}{\sqrt{\left(\frac{1}{n}+\frac{\bar{x}^2}{\sum x_i^2-n\bar{x}^2}\right)\hat{\sigma}^2}}\sim t_{(n-2)}$	$\frac{\hat{\beta}_1-\beta_1}{\sqrt{\frac{\hat{\sigma}^2}{\sum x_i^2-n\bar{x}^2}}}\sim t_{(n-2)}$	$\frac{\left(\hat{\beta}_0+\hat{\beta}_1x_0\right)-(\beta_0+\beta_1x_0)}{\sqrt{\left(\frac{1}{n}+\frac{(\bar{x}-x_0)^2}{\sum x_i^2-n\bar{x}^2}\right)\hat{\sigma}^2}}\sim t_{(n-2)}$

$$R^2=\frac{\left(\sum_{i=1}^{n}x_iY_i-n\bar{x}\bar{Y}\right)^2}{\left(\sum_{i=1}^{n}x_i^2-n\bar{x}^2\right)\times\left(\sum_{i=1}^{n}Y_i^2-n\bar{Y}^2\right)}$$