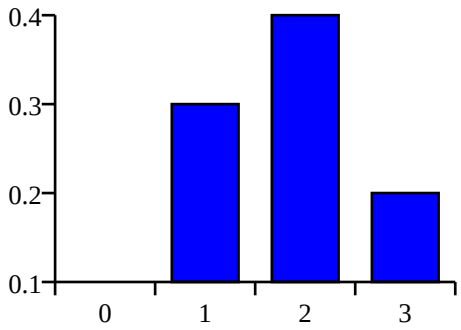
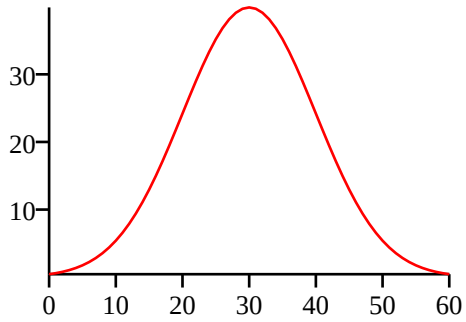
Probability Revision Sheet (with Diagrams)

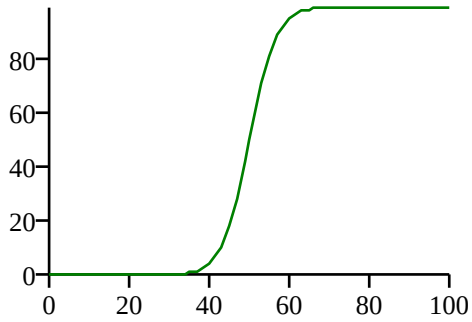
PMF (Discrete Variable Example)



PDF (Normal Distribution)



CDF Example



Formulas and Key Notes

PMF: P(X=x) = p(x), Σp(x)=1

PDF: $\int f(x)\,dx = 1$
CDF: $F(x)=P(X \leq x)$

Distribution	Type	Formula	Mean	Variance	When to Use
Bernoulli	Discrete	$p^x(1-p)^{(1-x)}$	p	$p(1-p)$	Single trial
Binomial	Discrete	$C(n,k)p^k(1-p)^{(n-k)}$	np	$np(1-p)$	Fixed trials
Poisson	Discrete	$\lambda^k e^{-\lambda} / k!$	λ	λ	Rare events
Normal	Continuous	$(1/\sqrt{(2\pi\sigma^2)})e^{(-(x-\mu)^2/2\sigma^2)}$	μ	σ^2	Symmetric data
Std Normal	Continuous	$Z=(x-\mu)/\sigma$	0	1	Hypothesis testing
Log-Normal	Continuous	$\ln(X) \sim N(\mu,\sigma^2)$	-	-	Skewed positive