Binomial pmf and CDF

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## pmf

We can use the base plot functions in R to create a plot of the pmf for a binomial random variable $X$ with $n=13$ and $p=0.6$ — i.e. $X \tilde{ }B(13, 0.6)$.

 n <- 13
 p <- 0.6
 x <- -1:14
 pmf <- dbinom(x, n, p)
 plot(x, pmf, type="h", xlab="x", ylab="p = P(X=x)", main="X~B(13, 0.6)", ylim=c(0, 0.25), xaxt="n")
 axis(1,at=seq(0,14,by=2))
 text(x, pmf+0.005, round(pmf, digits=4), cex=0.6)



## CDF

The CDF may be plotted analogously.

 x <- -1:15
 cdf <- pbinom(x, n, p)
 plot(x, cdf, type="s", xlab="x", ylab="P(X<=c)", main="X~B(13, 0.6)", xaxt="n")
 axis(1, at=seq(0,14,by=2))



Just for fun we can overlay the two.

 pmf <- dbinom(x, n, p)
 plot(x, pmf, type="h", xlab="x", ylab="p", main="X~B(13, 0.6)", ylim=c(0, 1), xaxt="n", col="red", lty=3)
 lines(x, cdf, type="s", xlab="x", ylab="P(X<=c)", main="X~B(13, 0.6)", xaxt="n")
 axis(1,at=seq(0,14,by=2))

