

14. Calculating binomial probabilities on the calculator

There are two handy commands on the TI-Nspire for finding binomial probabilities:

`binomPdf(n, p, k)` computes $P(X = k)$

`binomCdf(n, p, k)` computes $P(X \leq k)$

You will need to open the *Calculator Scratchpad* (press = or on **A** on the clickpad). These two commands can be found in the *Distributions* menu within the *Statistics* menu. You can access them by pressing **(menu)** \rightarrow *Statistics* \rightarrow *Distributions*. A dialogue box will appear asking for your input. Type n (the number of observations), p (probability of success), and k (number of successes).

Binomial Pdf

Binomial Cdf

For the parents having $n = 5$ children, each with probability $p = 0.25$ of type O blood:

$$P(X=3) = \text{binomPdf}(5, 0.25, 3) = 0.08789$$

TI-Nspire Technology Corners

To find $P(X > 3)$, we used the complement rule:

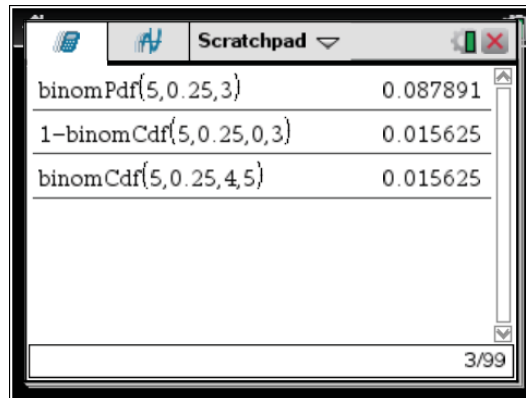
$$P(X > 3) = 1 - P(X \leq 3) = 1 - \text{binomCdf}(5, 0.25, 3) = 0.01563$$

Of course, we could also have done this as

$$\begin{aligned} P(X > 3) &= P(X = 4) + P(X = 5) \\ &= \text{binomPdf}(5, 0.25, 4) + \text{binomPdf}(5, 0.25, 5) \\ &= 0.01465 + 0.00098 = 0.01563 \end{aligned}$$

On the TI-Nspire, you can also calculate using:

$$\begin{aligned} P(X > 3) &= P(X = 4) + P(X = 5) \\ &= \text{binomCdf}(5, 0.25, 4, 5) \\ &= 0.01563 \end{aligned}$$



A screenshot of a TI-Nspire Scratchpad window. The window title is "Scratchpad". It displays three rows of calculations:

$\text{binomPdf}(5, 0.25, 3)$	0.087891
$1 - \text{binomCdf}(5, 0.25, 0, 3)$	0.015625
$\text{binomCdf}(5, 0.25, 4, 5)$	0.015625

The bottom right corner of the window shows "3/99".