Chapter 13 / **Example 5**

Binomial probabilities

a In a family of six children, find

i the probability that there are exactly three girls

ii the probability that exactly three consecutive girls are born.

b A study shows that 0.9% of a population of over 4 000 000 carries a virus. Find the smallest size of sample from the population required in order that the probability of the sample having no carriers is less than 0.4.

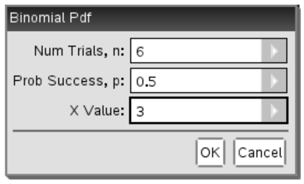
$G \sim \mathrm{B}(6,\ 0.5)$. Find $\mathrm{P}(G = 3)$.

Open a new document and add a Calculator page.

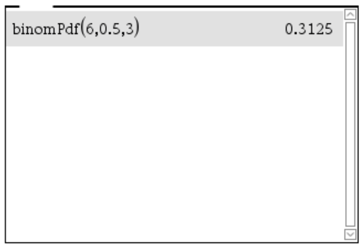
Press menu 5:Probability | 5:Distributions | A:Binomial Pdf...

Enter 6 as the number of trials, 0.5 as the probability of success and 3 as the X value.

Press enter or click OK with the touchpad.



The GDC displays the solution $\mathrm{P}(G = 3) = 0.3125$.



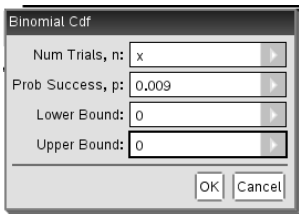
P(3 consecutive girls) = $4 \times \left(\frac{1}{2}\right)^6 = 0.0625$.

Type f1(x) and press ctrl :=.

Press menu 5:Probability | 5:Distributions | B:Binomial Cdf...

Enter x as the number of trials, 0.009 as the probability of success and 0 as the Lower Bound and 0 as the Upper Bound.

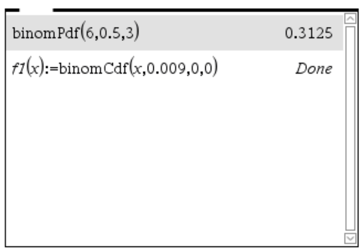
Press enter or click OK with the touchpad.



The function *f1*(*x*) is defined.

Display this function in a table.

Press ctrl doc (+page) and add a Lists & Spreadsheet page.



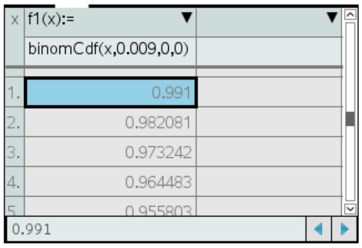
Chapter 13 / **Example 5**

Binomial probabilities

Press ctrl T to change from a spreadsheet to a table.

Press enter.

The GDC displays a table of *f1*(*x*).



Scroll down the table using ▼.

From the table, you can see that n = 102 is the first value for which $\mathrm{P}(C=0)<0.4$.

Hence n = 102 is the minimum value required.